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Your COMPUTER

▶ DECEMBER 1986 VOL. 6 NO. 12

BRITAIN'S BIGGEST-SELLING HOME COMPUTER MAGAZINE



TAILS YOU LOSE, HEADS I WIN

AVOIDING THE CHRISTMAS CONMAN

SEASONAL BUYERS' GUIDE – COMPUTERS COMPARED

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10
SEE C

BEATING HEWSON HITS – IRIDIS AND ALLEYKAT REVEALED

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MASTERTRONIC COMPETITION WIN A MAGNUM JOYSTICK

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Back issues of the magazine from January 1986 onwards are available for £1.50 (U.K.), £3 (Overseas) from the Back Issues Department, 79-80 Petty France, London, SW1H 9ED.

CONTENTS

GADGET

Page 50 will help e
entertaining gifts f

ETS FOR YUPPIES

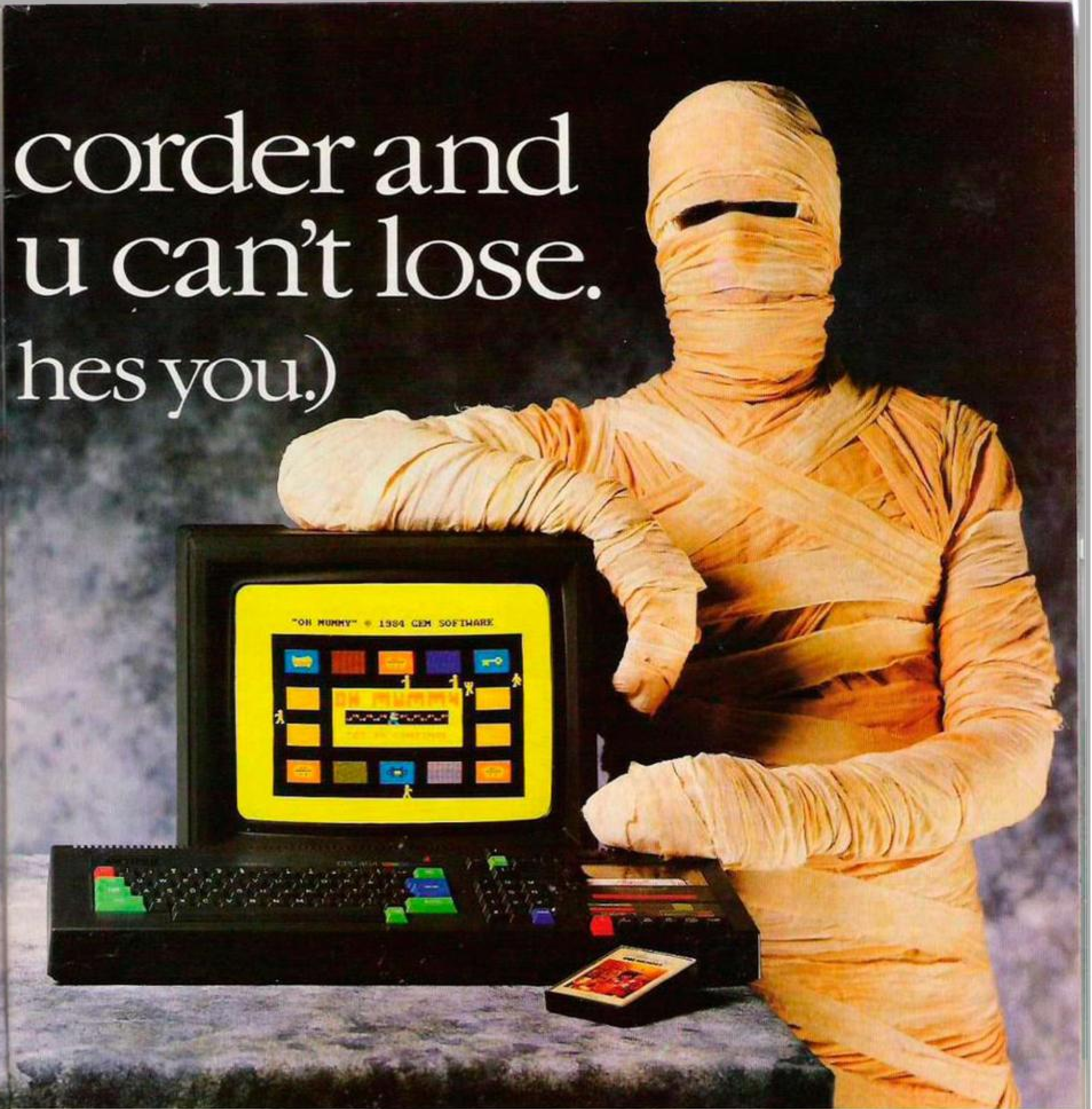
elp everyone buy those useless but
ifts for Christmas.



AUTUMN GOLD

Turn to page 14 for details of our £1,000 competition.
This month's 25-runner-up prizes are *Your Computer* binders.

Please also remember that no purchase is necessary to enter the instant prize section of this competition and that scratch cards can be obtained by sending a S.A.E. to the *Your Computer* offices at the address on this page.



To help you make the most of your 464, you can join the Amstrad User Club.

And there are lots of books and magazines devoted to it as well.

What's more you can buy joysticks, printers, disc drives, speech synthesisers and light pens to make it even more fun.

But perhaps the most pleasurable thing about the 464 is the price.

The complete home computer costs just £199 with green screen or £299 with colour monitor.

Not much to pay for a chance to get away from mummy.

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464/YC3

The Amstrad 464.

The complete home computer.

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While the Amstrad PC range of computers is still rather more difficult to obtain than shares in the Trustee Savings Bank were at their launch, question-marks over the reliability of the machine in certain circumstances are already starting to surface. After a recent report in *The Sunday Times* concerning the tendency of the machine to over-heat in networking applications, shares in the company fell 10 pence when trading started on the Stock Exchange the following Monday, wiping millions of pounds from the value of the company. Some reports also indicate that the reliability of the floppy disc drives is not what might be expected.

Those initial teething troubles, though, are bound to subside; the PC1512 range must offer one of the best PC Package deals of the moment. In particular, Amstrad

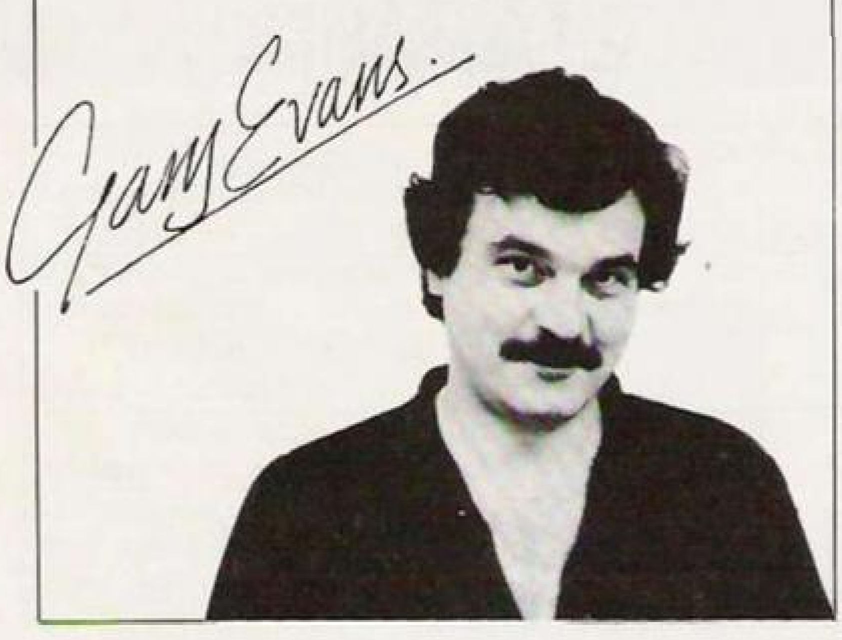
COMMENT

has managed to bring the cost of a hard disc-based system down to a level many users can now afford. The retail price of add-on hard drives for machines such as the Amstrad PCW or BBC Master range of computer is still between £500 and £600.

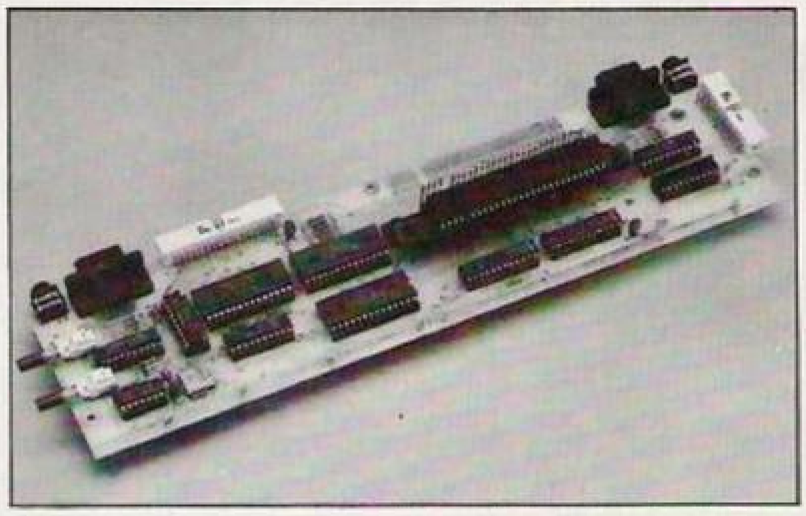
Compare that to the retail price of just £700 for a complete 10MB mono Amstrad PC system. Consider also that many add-on drives fail to provide the user with a sophisticated operating system capable of partitioning hard drives and constructing subsidiary directories. Without such support a hard disc can soon become a monster to use.

It is interesting to note that Amstrad has mis-judged the demand for hard disc systems, shipping mostly floppy systems in the initial consignments from the Far East. That has meant that the company has had to use its Southend plant to install hard drive units in the U.K., leading to further delays in much-sought-after supplies reaching the shops.

When the initial problems of supply and, possibly, reliability are overcome the PC1512 is set to capture a large slice of the low-cost clone market. It should be the computer of 1987.



Good disciple



A multi-purpose Spectrum interface has been released by Rockfort Products. The Disciple, which allows disc drives, a printer and two joysticks to be connected to the Spectrum, costs £84.75 and has been designed to fit neatly beneath the computer.

With a very impressive maximum storage capacity on the two drives of up to 1.6MB, the Spectrum can load a full 48K program in less than four seconds, providing a considerable time saving to the user.

The unit has been designed so that it needs no special commands and is operated entirely on the normal Spectrum Basic. The dual Kempston and Sinclair-compatible joystick ports open a new world for games players, as does the snapshot button, which allows games to be re-loaded rapidly from disc. With the price taken into consideration it must be one of the best ways to upgrade your machine.

Successful combination

Akhter plc, which has worked in the Acorn/BBC sector for more than 10 years, has launched a combination disc drive for the BBC. The unit, which can use 3.5in. and 5.25in. discs, is capable of normal 40/80-track switchable functions and can also read software in either of the two media sizes.

That feature has also been extended so that data can be copied from either format.

The package is complete with all the necessary cables, a utilities disc, a comprehensive users' manual and a full two-year warranty.



Psion of the times

In just six months Psion has become the world's largest producer, by volume, of hand-held computers. With Organiser II sales exceeding £1 million per month, Dr. David Potter, the company founder and chairman, believes that Psion is only just beginning to tackle the world market estimated at a value of £500 million.

The successful strategy adopted by Psion has been to produce a competitively-priced, £99.50, hand-held computer which appeals to the very different business and home markets, by incorporating features such as diary and calendar, as well as the programming capability to handle complex business applications.



Setting the Pace



Following its recent contract to manufacture Nightingale modems for Amstrad, Pace Micro Technology has won the contract to badge-engineer its serial interface and communications software.

The long-term agreement is intended to supplement the Far East production of the Amstrad serial interface. The Pace peripheral will contain as standard the respected Commstar viewdata software stored on an EPROM, making Commstar the standard comms package for the CPC range of computers.

In addition, the pack will contain a free subscription to Microlink on Telecom Gold, following a separate agreement between Amstrad and Database Publications.

Peripheral power

Einstein owners who have been waiting for popular games software to be converted to work on the computer need wait no longer with the recent release of a new peripheral. The Spectrum Emulator, manufactured by Tatung and retailing at £49.95, connects to the back of the Einstein and allows certain Spectrum cassette software to be loaded or saved.

The package also includes a disc which allows the emulator to run up to 20 games, which makes it possible to play such well-known titles as *Starorion*, *The Hobbit* and *Daley Thompson's Decathlon* from the standard Spectrum cassette. An additional disc can be bought for £9.95 which allows the popular *Elite* to be played on the Einstein.

The release of the emulator gives Einstein owners an even wider range of software from which to choose, adding to the Amstrad-compatible programs it is already possible to use.



Captain's Log . . . War Date 10.01.44

Enhanced for Amiga – Better Graphics, Sound, Play Action!

"Captain's Log, October 1, 1944. 0250 Hours. Fleet submarine USS Hammerhead proceeding Southwest at cruising speed. Our mission: intercept enemy convoy off the coast of Borneo. Disperse and destroy."

Atari 520ST screens shown



"0300 Hours. Two hours until dawn. Radar picks up convoy, escorted by two destroyers. We believe that one of the enemy's valuable oil tankers is part of convoy formation."



"0400 Hours. Lookouts on the bridge. Target identification party reports one tanker, 6,000 tons, troopship of 10,250 tons, with two *Kaibokan*-type escorts. Moving into attack position."



"0500 Hours. Sound General Quarters! Battle stations manned. Preparing for torpedo run. Gauge Panel OK. Periscope OK. Charts and Attack Plot Board OK. All mechanical systems OK."



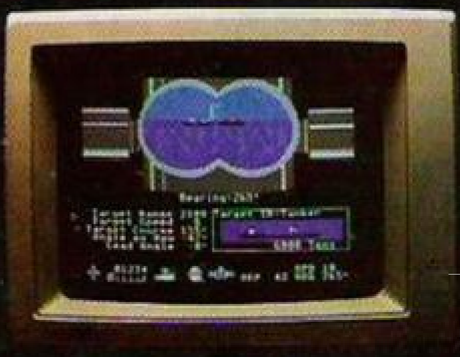
"0525 Hours. Torpedo rooms report full tubes forward and aft. Battery at full charge for silent running. We hope water temperature will provide thermal barrier to confuse enemy sonar."



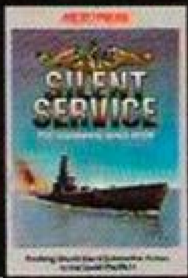
"0600 Hours. We are at final attack position. Convoy moving at 10 knots. Target distance decreasing rapidly . . . Crash Dive! Escorts have spotted us and are turning to attack! Rig to run silent."



"0700 Hours. Depth charged for one hour. Some minor damage, but repair parties at work. Destroyer propeller noises receding. We'll come to periscope depth for our return punch."



"0715 Hours. Torpedo tubes 1, 2, 3 fired. Two destroyers hit and sinking. One of the enemy's last tankers coming into 'scope view – an ideal target position. On my mark . . . Fire Tube 4! Fire 5!"



"Superb" raves Scott May in *On Line*, "strategic intensity and heart-pounding action have rarely been merged this successfully." *Analog* calls it flatly "the best submarine simulation so far." *Compute* comments "Silent Service's detail is astonishing." Join the more than 150,000 computer skippers who have volunteered for **Silent Service**, the naval action/tactics simulation – from MicroProse.

Silent Service is available for Commodore 64® 128™, Amiga™, Apple II family, Atari XL/XE, Atari ST, IBM and compatibles, Spectrum and Amstrad CPC.

MICRO PROSE
SIMULATION • SOFTWARE

Micro Prose Software Ltd.
The Walled Garden, Hyde, Chalford, Stroud,
Gloucestershire GL6 8PA.
Tel: 0453 886386.

Questionable program

Perhaps the most successful board game of last two years is *Trivial Pursuits* which, with its recent conversion to computer by Domark, has highlighted an untapped micro games market. The latest game of this ilk to appear is *Personal Quiz* by Colisoft.

Unlike other versions of the popular quiz game it allows the players to measure their intelligence and personality. The most original feature, however, is the X factor, a facility which can generate new logic questions every time the game is played.

Costing £9.95 and written for the Commodore 64/128 and the BBC, Personal Quiz should make a good present this Christmas for anyone who enjoys a challenge.

Prescribed price

Boots the Chemist has extended its 'You can't buy cheaper' policy to cover all the leading brands of home computer and accessories. Boots is so confident about its policy that it will refund the difference in price if you manage to find the same product at a cheaper price within seven days of purchase.

With Christmas approaching it must be good news to all who have to think about presents for the computer buffs in the family.

Robot released



British-based Universal Machine Intelligence Ltd recently unveiled the world's first Personal Working Robot. Designed for a varied range of uses, the robot, called RTX, will have manufacturing as well as scientific applications.

It is also hoped that the RTX will help severely disabled people not only in health care but also in educational situations by allowing them to carry-out experiments and other manual tasks on their own.

The initial production run of 100 units has already been sold to various companies and research organisations throughout Europe and the U.S. Costing £5,000, the RTX looks set to fill the space which exists in the market between the cheap and limited hobbyist robot and expensive custom-built industrial robots.

The robot is safe and easy to install and, unlike conventional robots, is designed for mass production. Controlled by an IBM or IBM-compatible machine and sophisticated software, the RTX can be operated by non-expert users, as well as allowing competent users to develop their own programs.

The robot has a six-axis arm and can carry a payload of up to two kilogrammes and position it anywhere within a space of 30 cu. ft.


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Your Computer

AUTUMN GOLD

TREASURE HUNT

Rules and Instructions

The Autumn Gold Treasure Hunt Competition concludes this month with part three. The third and final special treasure hunt card to be given away is on the front of this issue. If you missed parts one or two, don't worry. A back issue of *Your Computer* can be purchased for £1.50 from Back Issues Dept., Your Computer, 79-80 Petty France, London SW1H 9ED. (Alternatively by sending a SAE to the same address you can receive a photocopy of the competition pages). By collecting the cards, using the numbers and solving the three picture puzzles, you could find the secret location of the hidden treasure chest and win the first prize of £1,000. There are also 25 instant prizes offered each month, with the chance to win more prizes in the New Year.

Before you attempt to uncover any of the boxes, read the instructions on the card carefully. There are three possible ways to win. The first involves revealing the hidden boxes on your card by scratching off seven of the eight gold leaves, taking care to leave one intact. When you have done that, if there are six numbers plus one instant prize token (a picture of a £1 coin) you have a winning treasure hunt card.

To claim your prize, send your card with your name and address and details of where you bought the magazine to *Your Computer*, 79-80 Petty France, London SW1H 9ED, remembering to keep a record of the numbers on your card. Details of this month's instant prizes are to be found on the contents page. Remember that to claim using this method you must NOT have uncovered a black leaf under the gold.

If you have removed all 8 of the gold leaves on your card you still have a chance of winning an instant prize. Provided that one of the boxes you have revealed contains an instant prize token you can save it and try to collect another card with an instant prize token on it, thereby creating another winning combination. The January, 1987 issue of *Your Computer* will have details of the prizes and how to claim using this method.

Whether or not your treasure hunt card entitles you to one of the instant prizes, it always contains a set of six numbers which will help in your quest for the hidden treasure. Each month there will be a different set of numbers to uncover which relate to that month's picture puzzle.

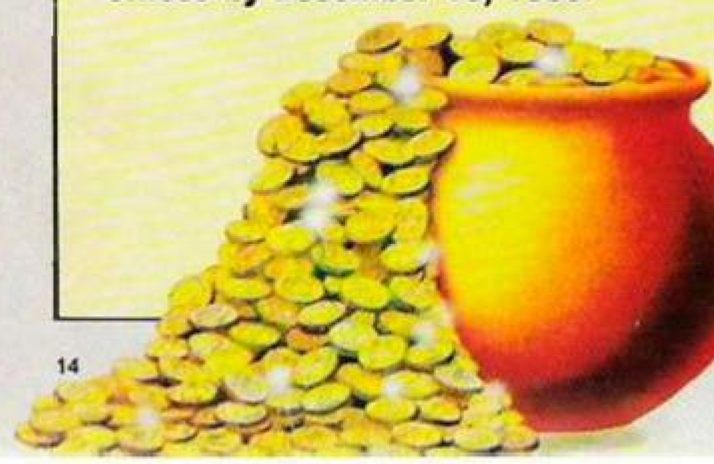
Study the picture opposite carefully. There is a way of using the numbers from your card and the clues in the picture to find a single *clue* word somewhere – not in the picture or on the card. Quite simply the picture leads to a source of information and the numbers lead to a specific item within that source. What to do with the numbers is also contained in the picture. The source of information can be found in any good bookshop or public library or viewed at the *Your Computer* offices. You must telephone us first to tell us what it is you require so that we can ensure nobody gains an unfair advantage. Once we have checked your solution we will arrange for you to view the relevant information. Each month ultimately leads to a single word and the three words will tell you where the treasure is hidden. Write and tell us the secret location and the first correct answer out of the hat will win the £1,000 prize.

Competition Rules

The winner of the competition will be the first correct answer drawn from the hat.

The name of the winner will be announced in the February issue of *Your Computer.*

All entries must arrive at the *Your Computer* offices by December 19, 1986.



Only one entry per household.

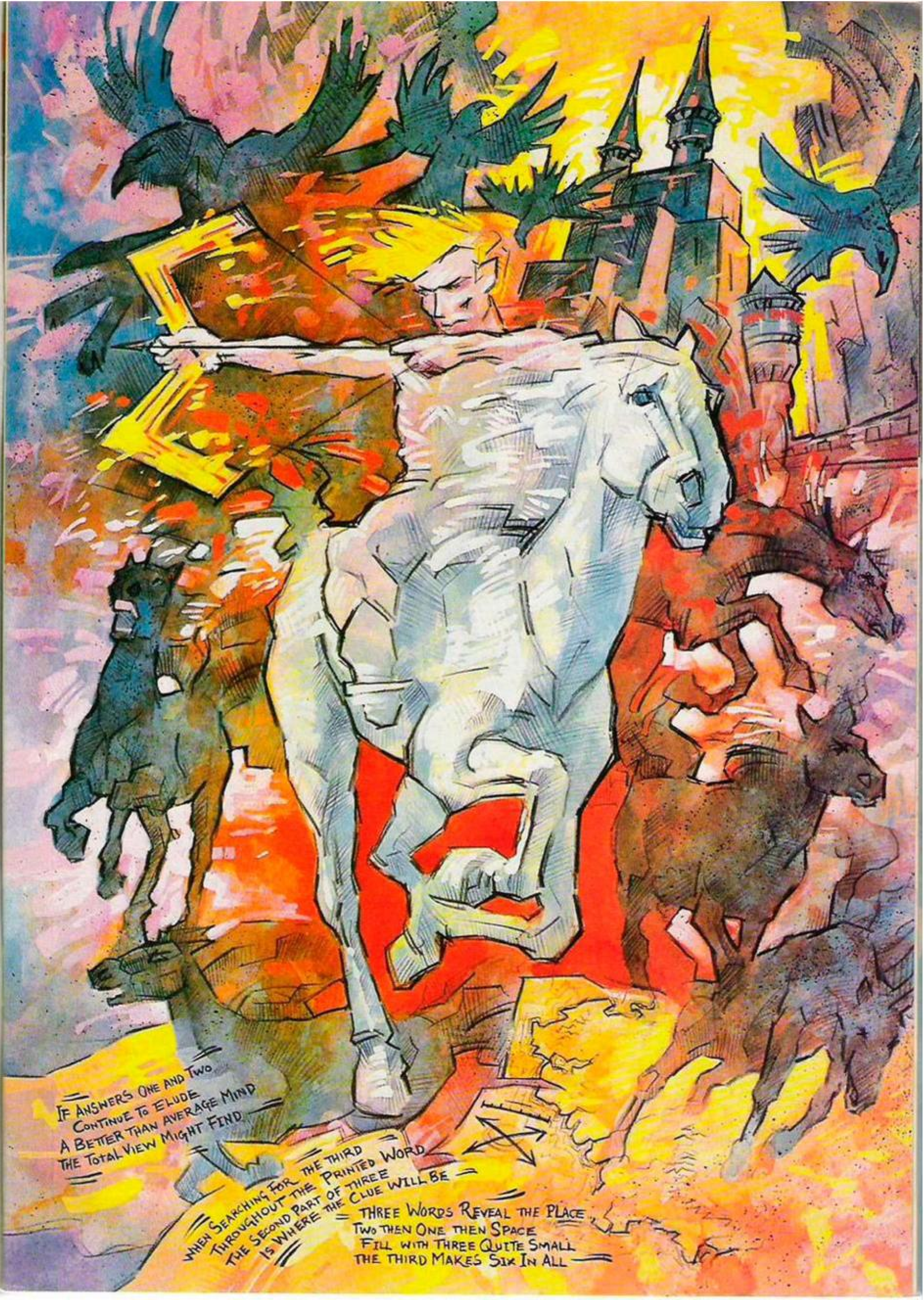
Entries to the competition cannot be acknowledged.

No employees of Focus Investments nor their agents or close relatives may enter the competition.

The decision of the Editor in all respects of the competition will be final.

No correspondence with regard to any aspect of the competition will be entered into.

Focus Investments assumes no responsibility or liability for any complaints arising from this competition.


IF ANSWERS ONE AND TWO
CONTINUE TO ELUDE
A BETTER THAN AVERAGE MIND
THE TOTAL VIEW MIGHT FIND
WHEN SEARCHING FOR THE THIRD
THROUGHOUT THE PRINTED WORD
THE SECOND PART OF THREE
IS WHERE THE CLUE WILL BE
THREE WORDS REVEAL THE PLACE
TWO THEN ONE THEN SPACE
FILL WITH THREE QUITE SMALL
THE THIRD MAKES SIX IN ALL

This chart is based on the MicroScope chart as compiled by Gallup.

MicroScope GALLUP

MicroScope is the weekly trade paper of the microcomputer industry. If your computer store doesn't display the latest MicroScope chart, ask the manager to call Mark Salmon on 01-631 1433 — we'll send a copy every week.

THE CHARTS

TOP 20

1	PAPERBOY	ELITE	SP
2	TRIVIAL PURSUIT	DOMARK	SP CO AM
3	LIGHT FORCE	FIL	SP AM
4	FIST II	MELBOURNE HOUSE	CO
5	DRUID	FIREBIRD	SP CO AM
6	INFILTRATOR	MINDSCAPE-U.S. GOLD	SP CO
7	DRAGONS LAIR	SOFTWARE PROJECTS	SP CO
8	1942	ELITE	SP CO
9	DAN DARE	VIRGIN	SP CO AM
10	GHOSTS AND GOBLINS	ELITE	SP CO AM
11	ACE	CASCADE	SP CO C1
12	GREEN BERET	IMAGINE	SP CO AM
13	COMPENDIUM HITS 10 VOL 3	BEAU JOLLY	SP CO AM
14	PUB GAMES	ALLIGATA	SP CO
15	THE GREAT ESCAPE	OCEAN	SP CO
16	STRIKE FORCE HARRIER	MIRRORSOFT	SP CO AM
17	SUPER CYCLE	EPYX-U.S. GOLD	CO
18	TRAP DOOR	PIRANHA	SP CO AM
19	LEADERBOARD	ACCESS-U.S. GOLD	CO AT
20	GLIDER RIDER	QUICKSILVER	SP AM

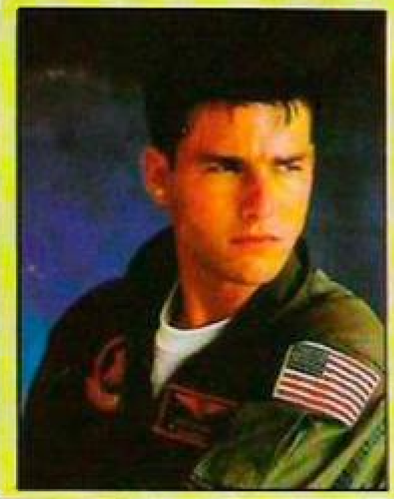
BUDGET TOP TEN

1	THRUST	FIREBIRD	SP CO AT AM BB
2	NINJA MASTER	FIREBIRD	SP CO AM AT MS
3	GO FOR GOLD	AMERICANA	CO
4	OLLIE AND LISA	FIREBIRD	SP
5	SPEED KING	MASTERTRONIC	CO C1 AM MS
6	NINJA	MASTERTRONIC	CO AT
7	WARHAWK	FIREBIRD	CO AT
8	HAPPIEST DAYS	FIREBIRD	SP CO
9	VID O POKER	MASTERTRONIC	SP CO AM C1
10	RAI TEMPLE	FIREBIRD	SP

BUBBLING UNDER

TT RACER	DIGITAL ENTEGRATION	SP
ALLEYKAT	HEWSON CONSULTANTS	CO
ISO	MASTERTRONIC	SP CO
GALVAN	IMAGINE	SP AM
DANDY	ELECTRIC DREAMS	SP
NOW GAMES 3	VIRGIN	SP CO AM
WAR	MARTECH	SP CO
STREET SURFER	MASTERTRONIC	CO
GALLIPOLI	CCS	SP

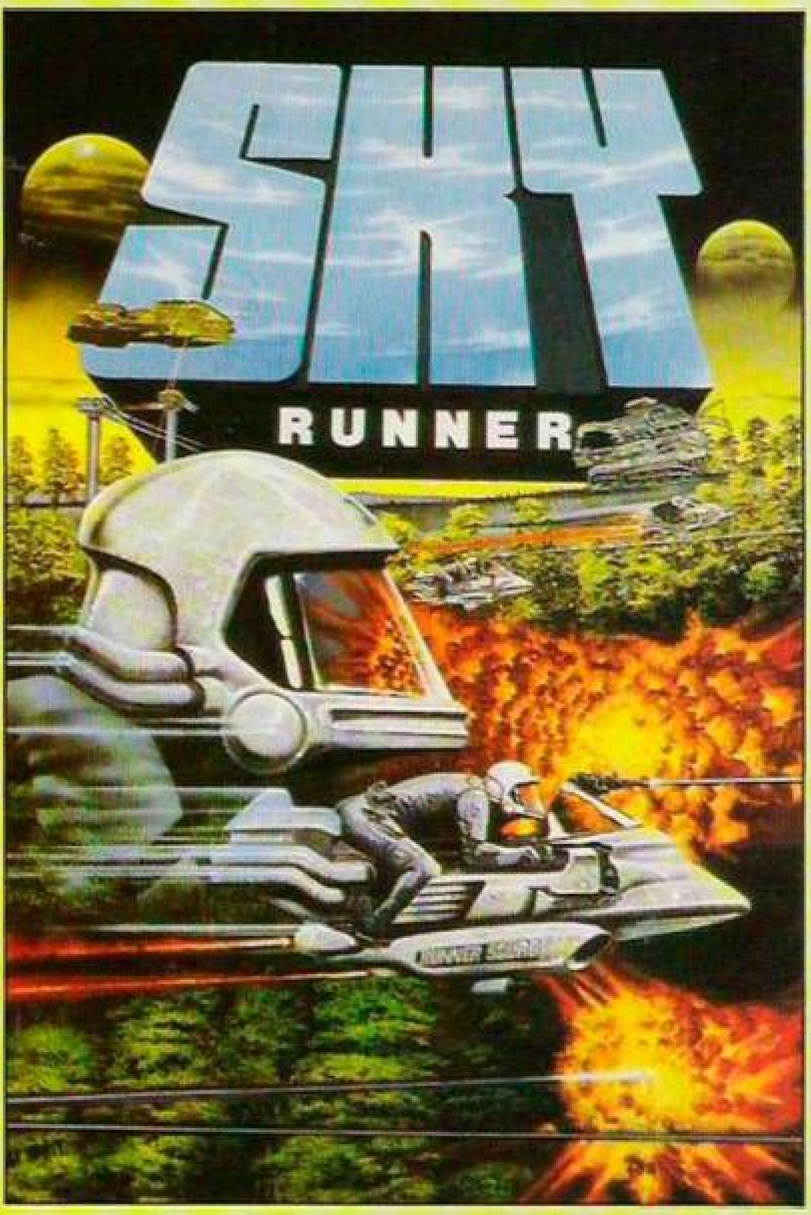
MACHINE CODES:
SP = SPECTRUM; CO = COMMODORE; AM = AMSTRAD; MS = MSX; AT = ATARI; V2 = VIC20





You too can play Maverick when Ocean release TOP GUN. Coming soon for your home computer.

Running out



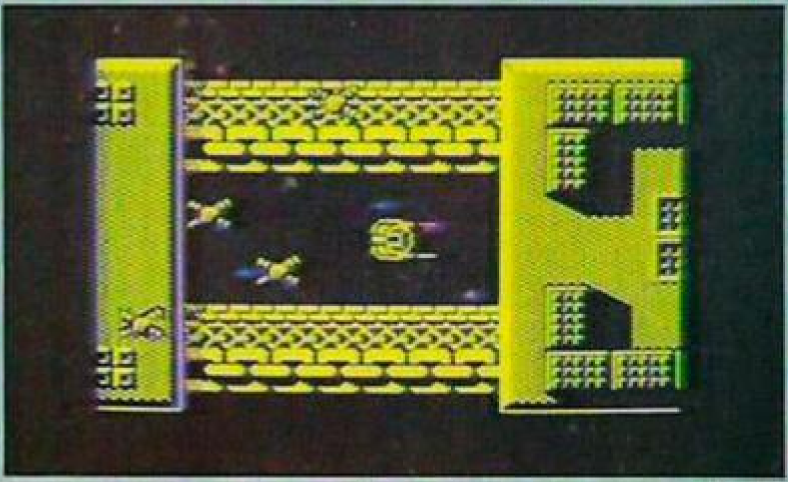
Cascade games has at last produced a follow-up to the much-vaunted number one hit *ACE*. Programmed by the same man, Ian Martin, the program has been being worked on for a number of months and, if the idea is any criterion, it should be a classic.

Based on the now legendary section of *Return of the Jedi*, with flying motorcycles hurtling through trees, and combined with a storyline which involves inter-planetary drug-busting, the game will be released for the Commodore 64 and Spectrum and will cost £9.95.

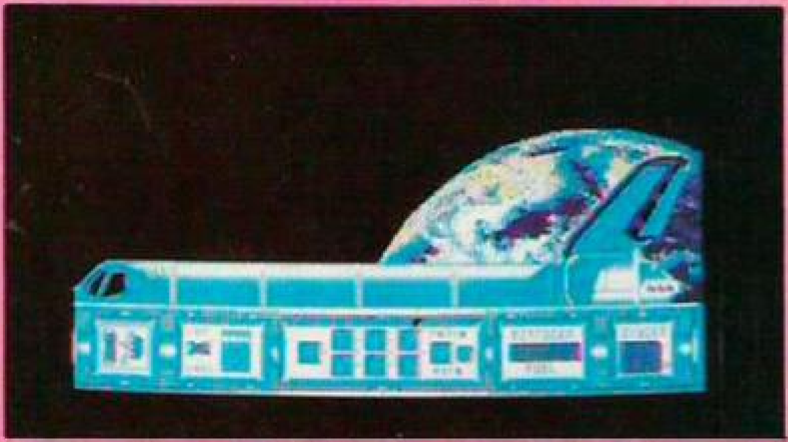
Spectrum 1, Commodore 1

In the never-ending "my computer's better than yours" arguments which seem to rage continually between Spectrum and Commodore owners, Hewson is one of the few software houses which can claim to have put arrows in the quivers of both sides. Now, however, Hewson has betrayed all Commodore owners by releasing the Andrew Braybrook classic, *Uridium*, on the Spectrum. If that was bad news for Commodore owners, even worse is that the game is just as good and, if anything, a little more playable.

Jesting apart, the conversion by Dominic Robinson is one of the most impressive Spectrum shoot-'em-ups yet and at £8.95 it should prove to be a best seller this Christmas.



Childish games



Microdeal, a company which has gained a reputation for supporting the Atari ST, has recently won the dubious award of the first company to release a sequel – before the original. That apart, *Karate Kid II* is based on the highly-successful new film, and should, if the screen shots are an indication, be equally popular.

As well as spectacular graphics, for which the ST is noted, Microdeal has included a soundtrack, Midi-compatible, which is a version of the film hit, *The Glory of Love*. The game promises an entirely new approach to karate.

Also new from Microdeal is *Space Shuttle*, a realistic simulation of the famous NASA spacecraft, though you will hope to fare better than the crew of Challenger.


KONAMI'S COIN-OP HITS
FIVE GREAT ARCADE GAMES FOR THE PRICE OF ONE
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..the name of the game
Imagine Software (1984) Limited, 6 Central Street, Manchester M2 5NS. Telephone: 061-834 3939 Telex: 669977.
Distributed in France by Ocean France Telephone: 93-42-7144. Distributed in Germany by Rushware Telephone: 2101-70040.

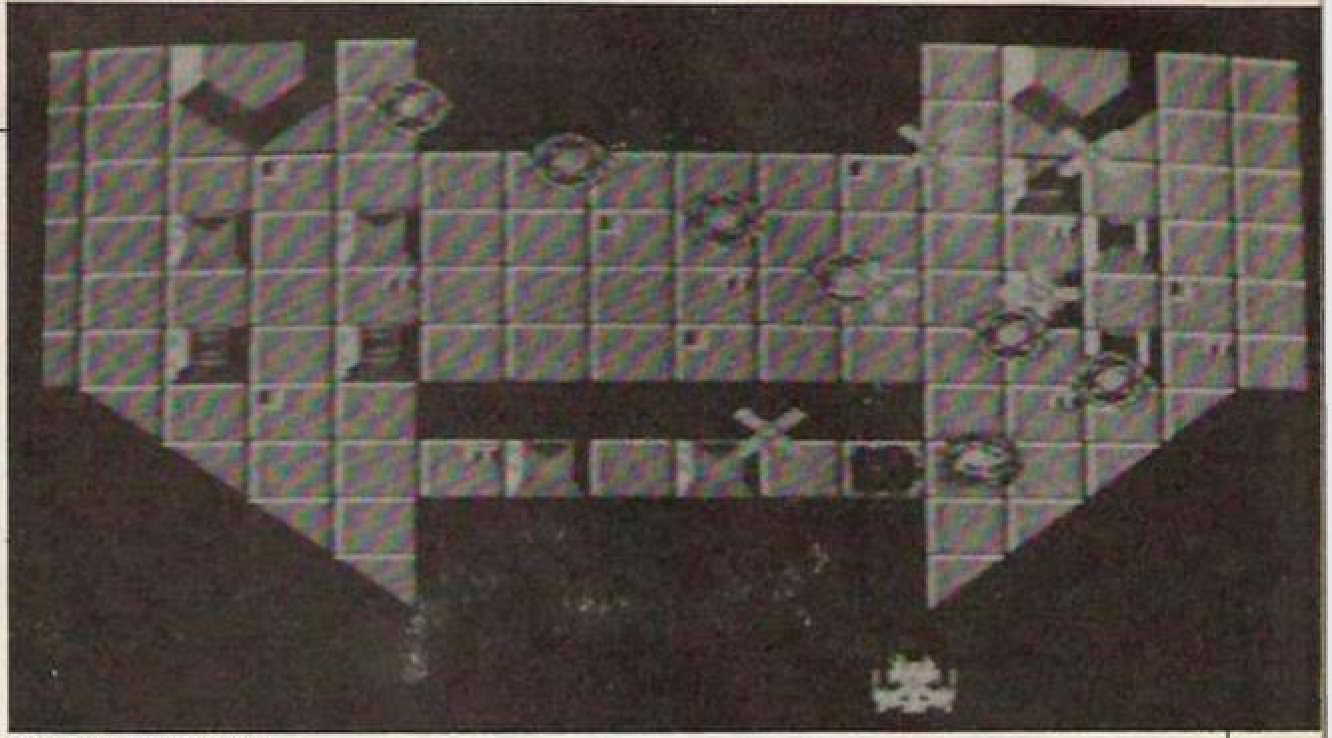
The master

Have you ever fancied having an arcade machine of your own? If you have not, you are certainly in a minority. If, like me, you would like nothing better, Ariolasoft has obtained the sole rights to the Sega Master system which at slightly less than £100 promises to revolutionise the home games market.

For your money, you can expect to take home the main console, two twin fire buttoned joysticks, the necessary cabling to link the machine to your television, and a 256K TransBot Sega Card. Those cards, which incidentally load software instantly, are soon expected to take over where cartridges left off.

To coincide with the launch of the machine, Ariolasoft is releasing eight games. *Black Belt, Fantasy Zone, World Grand Prix, Choplifter, Action Fighter, Action Warrior* and *Hang On*, all priced at £19.95. Having played the games, some are really exceptional, with *Fantasy Zone* being almost identical to the arcade original.

If, as Ariolasoft promises, the software base continues to expand, the Sega would deservedly be the games sensation of the year and if you are undecided about your Christmas present I can recommend it before almost anything else. I have left a note for Santa already.



Above: Astro Warrior.
Below: World Grand Prix.



Atari ST mania

Latest in the long line of new games to be released for the Atari ST range of computers is *Qball* from English Software. Looking something like a cross between *Snooker* and *Tempest*, I am informed reliably that the game allows 262,144 possible viewing angles, 2,500,000 directions of shot and 2,585,664 angles of shot.

If the game is as good as some of the English Software releases for the Commodore and Atari 800, it should be worth the wait, although whether anyone will validate those figures I somehow doubt.

Get wise

In a move not dissimilar from that of Gargoyle Games, Domark has announced that it is to start a new label dedicated to arcade-style releases, while keeping the original Domark label for games such as the hit *Trivial Pursuit*.

The first game to be released on the Streetwise label is *Orbix the Terrorball*. Available initially for the Spectrum, Orbix is described by its authors as a bouncing shoot-'em-up.

After Orbix will be *Kat-Trap*, a game based on a competition winner's storyboard.

Programmed by Design Design, the game will be available for both the Amstrad and the Spectrum, costing £8.95.

Say "KWAH", Redhawk returns

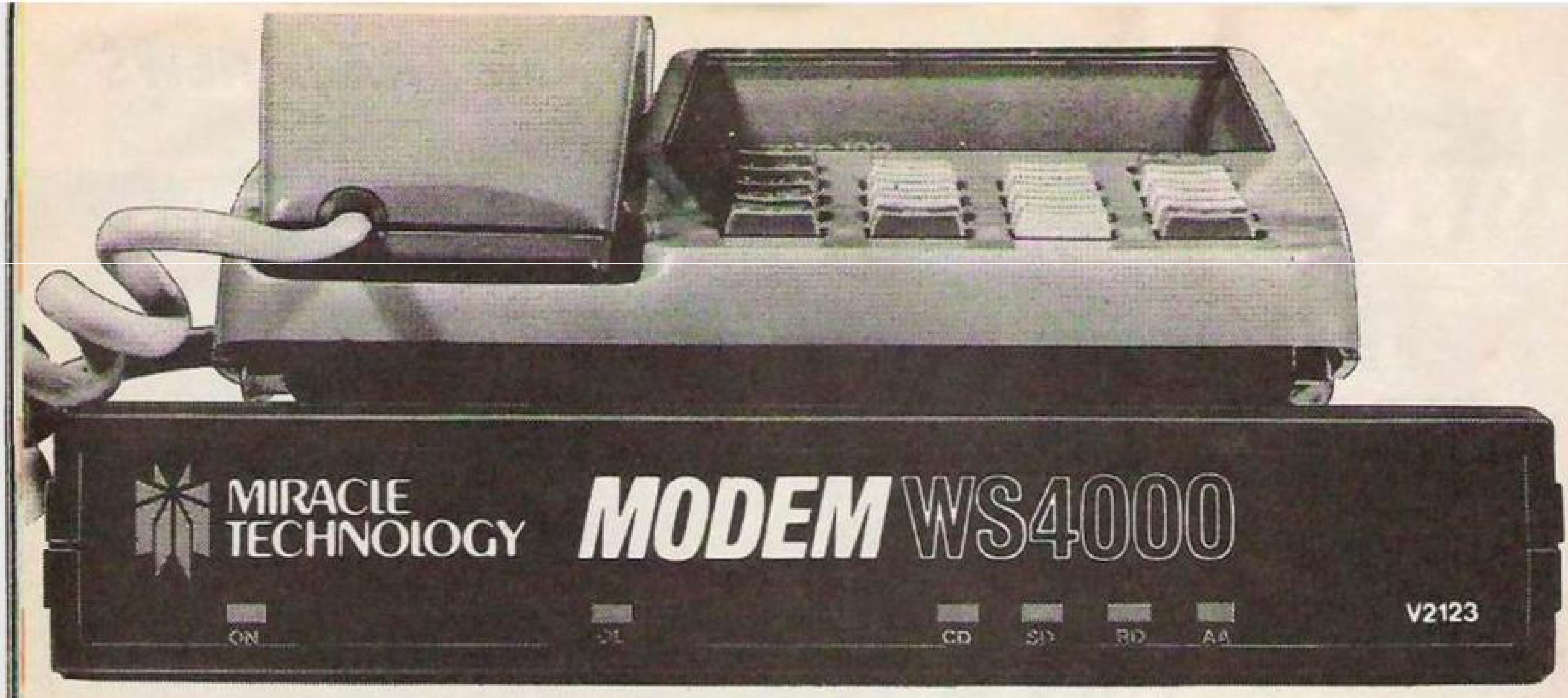
Not content with releasing *Fist II*, Melbourne House has bounced back from its management re-shuffle with two new launches and a red-hot licensing deal. Of the releases, *Kwah* is my favourite, although *Knuckleduster* was only a preview and therefore it is difficult to comment on it too much. Kwah is, as many will have guessed, the follow-up to *Red Hawk*, the much under-rated cartoon adventure.

If Red Hawk has been a little faster and a little more playabie it would have taken the market by storm and I am afraid that criticism applies to the follow-up.

Even so, the new story-line is still clever and sharp and followers of the original will not be disappointed.

Knuckleduster is a different thing altogether. Using a left-right scrolling screen, the game is an arcade kick-punch extravaganza which uses mettallix graphics and a catchy tune.

Available initially for the Commodore, a few might remember seeing it at a Commodore Show.



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Comms for PCs

A range of viewdata terminal packages for PC compatibles, under the Vidterm banner, has been announced by Triangle Corporation. Vidterm AMS is configured specially for the Amstrad PC1512 and there is Tandy 1000 version, too. One of the strengths of the £50 package is that the user can set up simple command language files to help automate various tedious functions such as comparing previously-prepared or saved frames with those on-line, e.g., for stock market watching.

For £145, the Vidterm viewdata terminal is accompanied by a full-featured scrolling text terminal with file transfer facilities and an on-screen timer.

Compatible offer

Readers may have noticed warnings in previous issues of *Your Computer* saying that the Spectrum 128 is incompatible with the Prism VTX5000 comms pack, on offer as part of the Micronet free modem offer. The surprising and welcome news is that the re-packaged Amstrad version of the 128, the Plus 2, apparently has no problem with the VTX.

No-one will guarantee that all VTXs will work, of course, so it might be best to test the combination before buying.

A lucky by-product of software changes to the new Spectrum ROM is that the clash caused by VTX software initialisation now results in the Plus 2 powering-up correctly. The VTX software is not dumped into memory as it should be but the modem will work correctly if other terminal software is loaded.

Plus 2 ROMs fitted to old 128s have proved successful, too. Those with modem-less 128s might like to explore the possibility of replacing their current ROM with the new version, while prospective Plus 2 owners should be able to take advantage of the Micronet VTX offer after all.

Extension regulations

From December 1 it will be legal for anyone to wire telephone extensions in their homes without the need to utilise the services of a BT engineer. The only proviso is that you must have a BT-fitted main jack-socket to terminate the line from outside and that must not be tampered with.

The BT watchdog/governing body, Oftel, has issued a guide to extension wiring and those who are not confident of doing the job themselves will still be able to pay for a BT engineer to do the work.

Commstar II

The name Commstar has been associated mostly with the Pace Amstrad CPC comms solution but the name truthfully belongs to the original BBC comms ROM which Pace launched nearly four years ago.

Now Commstar II for the BBC is here. The old 8K EPROM has been replaced by a 16K version of the dual scrolling text/viewdata package. Commstar has been spruced-up by its author, Andy Hood, with the introduction of drop-down menus and on-screen status indicators.

The rather simple viewdata side of the ROM has been improved considerably with comprehensive frame-printing facilities and the addition of a mailbox editor. Commstar II appears to be aimed at users requiring ease of use as a priority. The transition from I to II has not affected the price, which remains at £34.

Astracom modem

This has been the year of the "smart" modem. Along with the Miracle WS3000/4000, Pace Series 4/Linnet, AaronFay 2122, among many, Astracom, designer of the former Bright Star QL modem – has joined the fray with its Astracom 1000 modem.

The 1000 is claimed to be the cheapest intelligent modem on the market. At £145 it is £5 less than the Miracle Technology WS4000, though the Pace Linnet will be £5 cheaper in turn when it is launched at the end of the year.

The V21/23 – 300 and 1,200/75 baud – AMD7911 chip-based modem is a development of the Bright Star and still incorporates the built-in parallel printer port of the latter, which is exceptional in a sub-£200 modem. Hayes compatibility costs an extra £25 to £35 depending on the level of software required, though the modem is supplied in base form with the Astracom non-standard control code modem support.

A range of specially-tailored software packs is available for QL and Amstrad PCW, while BBC and ST packs are hoped for soon. New technology chips just reaching the market could mean that the Astracom will have an optional V22 – 1,200 full duplex – upgrade option at a budget price early next year.

Golden Prestel link

That watchword, gateway, has struck again. Last month we reported a new gateway link to the States for Microlink users on BT Gold and also a proposed Prestel link to Teletel in France. Then there was the gateway link for Micronet access to the Shades MUD game. Now Prestel has announced a gateway link to BT Gold.

The link is primarily for easy access, by Prestel users, to general Gold facilities – especially messaging and one-stop shopping for all your e-mail. Specially-written gateway PAD software converts data traffic both ways across the link into understandable forms.

That is necessary because Prestel has a 40-column non-scrolling display while Gold has 80-column scrolling; and certain key commands, or control codes, to which Gold responds are not available from standard viewdata keyboards, e.g., BRK which is handled by *B£.

The PAD software interface is a variant of the Shades interface, with a few enhancements and no input split-screen window.

Specially attractive to Prestel users in remote parts of the country, the link allows relatively cheap call rate access to Gold via the Prestel local call rate network. The only alternatives previously were to call Gold London numbers or use PSS.

Micronet will be one of the first areas on Prestel to have access to one of the new gateways, probably some time in December. Other Prestel areas will also have gateways to Gold, though they may have links to different Gold computers – effectively closed user groups – and appropriate tariffing. No tariff details had been decided at the time of writing, though we have seen a working demonstration.

SANTA'S SELECTION

Christmas is approaching fast, and with it a confusing choice of computers to buy. Your Computer guides you through the jungle.

Winter is the time of year when many computer enthusiasts look either to the chimney or to their American Express cards, depending on their age, either for their first computer or for a new machine to upgrade their current systems. While the sales of computer hardware and software during this period are not likely to return to the massive levels of the 1983 season, the winter quarter still accounts for a significant proportion of the sales revenue for many computer manufacturers.

In recognition of that fact both Amstrad and Commodore offer re-packaged versions of aold machines to stimulate the interest of the Christmas buyer. The Amstrad/Spectrum Plus II computer is a re-designed version of the old Sinclair 128 machine, while Commodore has re-designed its ageing CBM64 computer and designated it the 64C. This machine is bundled with a cassette datacorder and mouse, plus a selection of games software.

New hardware is thin on the ground this year, although new models from Atari, in the form of additions to its ST range, are exciting models. Pride of place in terms of new hardware must go to the Amstrad PC1512 range of computers. Low-cost, high-quality and a performance which outstrips many similar low-cost PC clones make the Amstrad PC the obvious choice for those demanding the flexibility of PC computing.

Best buy for Wordsmiths

Amstrad PCW8256/8512



Marketed as the computer which is more than a word processor yet costs less than most electric typewriters, the two computers which comprise the PCW range offer a combination of price and performance which is difficult to beat. At £300 plus VAT, the 256K single disc drive system features a monitor/processor unit, a keyboard and a printer, while the 8512 adds £100 to the price of the system and offers a dual disc drive, 512K RAM specification.

Software bundled with the PCW computer includes CP/M Plus, a.k.a. V3.0, Mallard Basic and the turtle-based language Logo, in addition to Locoscript, a comprehensive word processing program from Locomotive Software. It is the last package which transforms the system into a powerful stand-alone word processing system which, by virtue of the integrated design philosophy which applies equally to the hardware and software, offers professional wordsmiths an easy-to-use system capable of producing a high standard of output.

Despite the marketing campaign of Amstrad, which is designed to promote the computer as a dedicated word processor rather than as a general-purpose computer, when running CP/M the PCW performs as a flexible general-purpose computer system. An increasing range of software, from spreadsheets to databases through vertical applications packages, are available at reasonable prices.

For those who require a computer which will be used for preparation of a large number of text documents, the PCW8256 is an ideal choice. Those who are likely to use the system in conjunction with other third-party applications software may find that the extra £100 necessary to buy the 8512 model is worth spending, as the second disc drive and additional RAM make using spreadsheets and databases easier, keeping the disc swaps on a single drive system to a minimum.

INFORMATION	
PCW8256	**£399 + VAT***
PCW8512	**£499 + VAT***

***Note that some outlets discount the price of the PCW.**

Amstrad Consumer Electronics,

Amstrad PC1512

A few years ago it would have been only the most wealthy home users who could have afforded a PC. Today, while the cost of using a PC with an authentic IBM pedigree is still high, the wealth of low-cost clones, of which the Amstrad is an excellent example, means that PC computing is within the reach of anyone who can afford to spend £500 on a computer.

One of the major attractions of the Amstrad PC range is that they bring the cost of systems based on hard disc drives to a level considerably below £1,000 – a 10MB mono system is £699 plus VAT. Having used a hard disc, users will find themselves reluctant to return to a floppy-based system. The advantages in using high-capacity hard drives are that users will no longer have to swap data and application discs constantly while using the computer.

The Amstrad PC builds in a considerable number of interfaces as standard, in contrast to the usual PC tradition of charging extra for anytrhing from add-on memory to a printer



driver card. The range of built-in screen display modes, too,m is greater than found on the majority of PC clones.

Those formats include a special non-IBM standard hi-res mode designed to be exploited by third-party software houses producing games for the machine. To add further to the potential of the machine in a games-playing role, Amstrad has included a joystick port in the base level specification of the PC. A mouse is also bundled with the PC1512 range of computers.

Bundled software includes the MS-DOS and CP/M-86 operating systems and GEM Desktop and Paint although, signbificantly the GEM Write word processing software is not included in the basic cost of the machine.

For the small businessman, the Amstrad PC1512 range offers excellent value. The low-cost route to a hard disc-based computer system and the vast range of software available under the MS-DOS format *will* make the machine an obvious choice for many.

Much PC software is still expensive but the arrival of the Amstrad has stimulated many companies to launch low-cost ranges of software. They include MicroPro, which recently announced WordStar1512, a WordStar package marketed at £70.

INFORMATION

PC1512	Starting at £449 + VAT

Amstrad Consumer Electronics,
Brentwood House, 169 Kings Road, Brentwood,
Essex CM14 4EF Telephone: (0277) 228888

Atari ST

The games machine of tomorrow is how many people view the Atari ST range of computers. With their excellent graphics and sound capability, plus a generous range of I/O ports, the computers provide an ideal environment for playing stimulating games. While good-quality games software for the computers has taken some time to develop, there is an increasing range of titles available.

Unfortunately, at present the cost even of the base model in the range puts the computer at the de luxe end of the games-playing market. At about £700 for a disc-based colour system, the Atari range is considerably more expensive than its games-playing rivals, most notably the Amstrad 6128. The extra money, though, gives the user access to the powerful 68000 16-bit processor rather than the distinctly long-in-the-tooth technology of the 8-bit Z-80 chip.



Software bundled with the ST includes GEM and while this graphics-based user interface is not an application in its own right, when used with GEM-compatible application packages it offers users, both novice and experienced, an attractive environment in which to work

Sales of the ST range have taken off during the course of this year but the computer still represents a top-of-the-range games-playing computer whose main appeal will be to those with deep pockets. While it can be used in business applications, other hardware, in particular the PCW and PC computer offered by Amstrad, provide higher performance at better prices for those with commercial applications for a computer.

INFORMATION

Atari St range	Starting at £347 + VAT

Atari Corporation (UK) Ltd.,
Atari House, Railway Terrace,
Slough Berkshire SL2 5BZ Telephone: (0753) 33344

Best buy for Gamesmiths

Sinclair range

Still the most popular computer in the U.K., there is no doubt that many people will find the price and software base of this machine too attractive to miss this Christmas. With the recent takeover, new life has been brought to the ageing machine and Amstrad recently launched the 128+2. That machine, which looks amazingly similar to the Amstrad CPC464, has a built-in tape recorder and therefore saves the hours of grief normally associated with loading programs on the Spectrum.

One problem from which the 128+2 suffers is incompatibility with some games. That



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stems from the original 128 and most new games do not suffer, but beware. Although not really a machine suitable for business, Saga has recently introduced a system called the Compliment which turns it into a complete business system for £299 plus VAT. Although expensive, the Compliment includes a 150cps printer, a disc drive and a high-quality keyboard.

For Christmas, or for an entry into computing, the Spectrum is always a good bet. With the new machines, there should be something to suit every pocket and with the vast software base it commands you will find games and programs almost anywhere.

INFORMATION

Spectrum +	£79.95 Inc. VAT
Spectrum +2	£169.95 Inc. VAT

Brentwood House, 169 Kings Road, Brentwood, Essex CM14 4EF



Commodore range

Although Commodore has been having a few difficulties recently, climaxed by the decision to cease manufacture in the U.K., the mainstay of the products, the Commodore 64, has continued to dominate the hardware market. In the last year, Commodore has made two real changes. First it introduced the Commodore 128, a more business-orientated machine which still retained the 64 as its base and, more recently, the 64C.

As with the Spectrum, the Commodore has a massive software base and it includes a wide variety of applications, as well as some superb games. Although considerably more expensive than either the Spectrum or the Amstrad, the Commodore has a devout following and this Christmas will probably be as successful as ever for the Maidenhead-based company.

The most valid criticism of the Commodore is the necessity to buy almost solely Commodore badged peripherals, which are more expensive. For anyone willing to invest as they upgrade, the Commodore can develop into an excellent system.

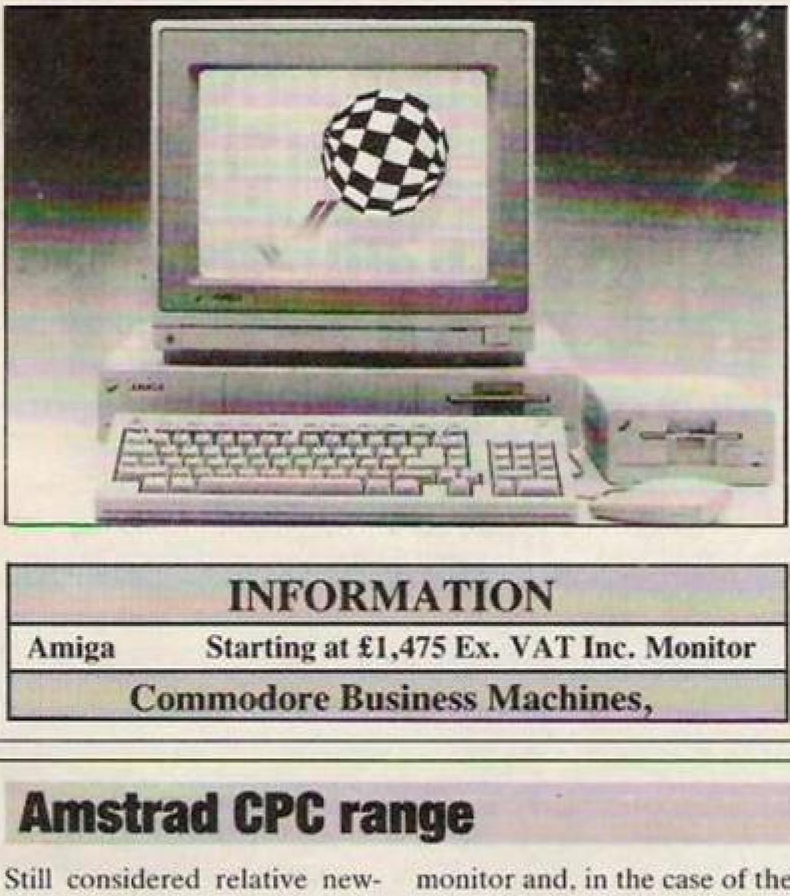
If money is no object for you this Christmas, or if your Santa has a penchant for spending large sums of money, the Commodore Amiga must be the machine for you. With 512K, true multi-tasking, and the most impressive graphics and sound available on any sub-£500 machine, the Amiga is technically superb. Unfortunately it suffers from lack of software, to the degree that to this day there is not one good word processor available.

If, however, you want to use the graphics or the sound, and are not worried about trying to use it in a business environment, the Amiga is the most fun 'gadget' this side of a Lamborghini. Of the few pieces of software available, Ariolasoft imports an amazing version of *Marble Madness*, and Psgnosis has produced two excellent arcade games.

INFORMATION

Commodore Range	Starting at £179 + VAT

Commodore Business Machines,
Switch Back, Gardener Road, Maidenhead, Berkshire.



INFORMATION

Amiga	Starting at £1,475 Ex. VAT Inc. Monitor

Commodore Business Machines,

Amstrad CPC range

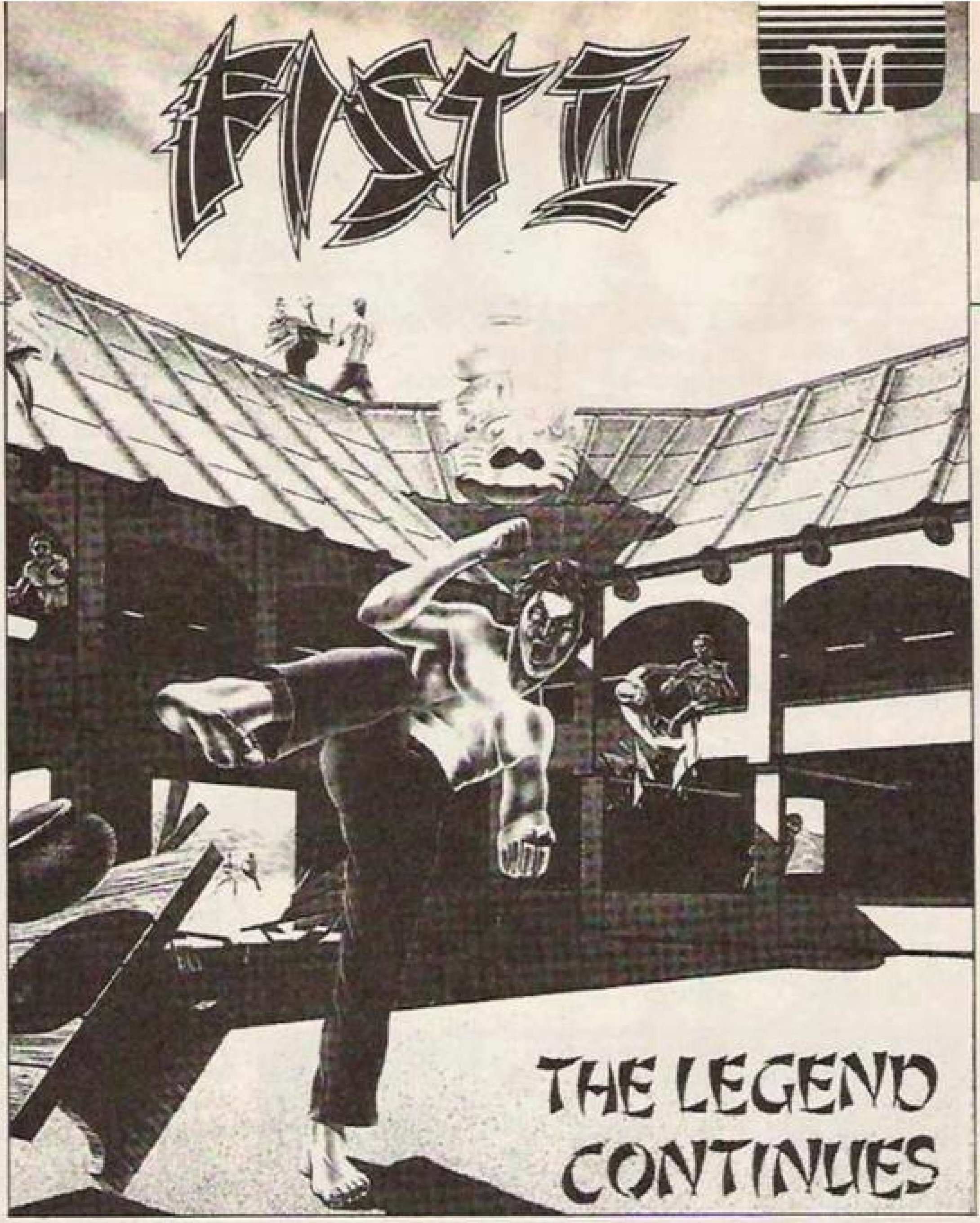
Still considered relative newcomers to the computer world, Amstrad home computers have found themselves a very dedicated niche in the market which, in many ways, resembles the original following of the BBC.

Although Amstrad chose to cease production of the 664 within a few months of its launch, there are still two levels of Amstrad computing, the CPC464 and the CPC6128. Both systems are complete with either a green or colour monitor and, in the case of the 6128, there is a built-in 3in. disc drive.

As home machines, the Amstrads represent a very good investment. Both have the potential to play any of the ever-increasing games software base but they can also, especially the 6128, be efficient as a business system, something exceptional at this price level.

Overall, the Amstrad, and particularly the 6128, must be the most impressive home computer available. It has plenty of memory, a superb Basic and a software base which increases in size by the day. If you are willing to make the initialk investment, it should be the machine this Christmas.





Fist II.

FIGHTING FIT

Is Fist II the ultimate challenge? Tom Courtney fights his way through the masses.

Like the assassination of President Kennedy, anyone can tell you where they were when they first saw *Way of the Exploding Fist.* It was the first of an entirely new genre. The combat game had arrived and the industry was never the same again. Like all good games it has created a string of imitators, some good, some not so good. What makes a good combat game and why have they remained so popular?

A good combat game is different from a shoot-'em-up in a number of ways. There are usually a large number of moves, often a vaguely oriental feel, and, with a little luck, a two-player option – beat up a friend is the name of the game.

So to start from the beginning. Fist, as it came to be known, was a revelation and still stands up well in comparison with later rivals. The best version was on the Commodore, while the worst was probably the Amstrad conversion.

On the Commodore, there was jolly, tinkly music, really realistic sound effects and fast game action. In one-player mode, the idea was to work your way through the levels, facing tougher and tougher opposition. To win a bout, you had to score two points. Every time you hit your opponent, he collapsed on the floor in a heap. The fight master then decided whether the blow was worth a full or a half-point.

At the end of the 30-second bout you won the round if you had the most points. If you managed to get two points, you would also receive a bonus according to how many seconds remained on the clock. Between some of the levels there was a spot of relaxation, like jumping over a bull or some such frivolity. The one-player version was flawed. Most people soon understood the vulnerability of the computer to the good old leg sweep. That was a rather ponderous move but the computer never had a good answer to it.

Cult status

The two-player option was where Fist really came into its own and accounted for the cult status of the game. Grasping a joystick each, two players would battle through the best of six rounds. There were 16 moves in Fist. Of those, there were about a dozen different attacking blows. Each had a specific counter; it was a question of watching your opponent like a hawk and trying to react to his moves. The winner normally needed a combination of plenty of experience and good reflexes; he had to know what to do, and do it quickly. That kind of inter-player interaction had never been seen before.

Two of the best-known imitators which followed were *Yie Ar Kung Fu* and *International Karate*. Yie Ar was the most successful of the clones, possibly due to the considerable marketing clout of Ocean. It differed from Fist in a number of ways. First, instead of collapsing into a little heap from one blow, you and the computer-controlled opponent had an energy level. Each blow would reduce it; the first person to zero died. There was a variety of moves and each level featured a different opponent with a different weapon, so different tactics were needed to deal with each.

The best of the Fist clones was International Karate, once again best seen on the Commodore. It had everything the afficianado could want. The graphics and animation were really pretty, with each round taking place in a different exotic location. The sound effects were also well up to scratch.

Its main advantage over Fist was that the opponents were 'intelligent'. If you started trying too many leg sweeps, he would go for the knee breaker. Conversely, too many roundhouse kicks or flying leaps and the computer would devise a counter move.

That made the game really difficult and the only way was to mix your shots. That meant becoming expert at all moves, knowing just what would be the best move in a given position. It was like playing a good human opponent, without all that ego-mauling if you lost.

The beat-'em-up also crossed into the ever-popular arcade adventure genre. That meant trading the large sprites and numerous movements for more plot. A leading exponent of this was *Kung-Fu Master.* Converted from the coin-op of the same name, it involved the player in a dour struggle as our hero tried to rescue his girl friend from the evil clutches of the triad. Most of the hordes of baddies which attack in large numbers could be disposed of with one blow but at the end of each level he faced a main meanie, where it is the usual tussle to see who runs out of energy first.

Bruce Lee was more arcade adventure than anything else. Only on the first few screens is ol' Bruce hassled by the Yamo and there are only two types of blow. That is not to say it was not a good game – just not a true combat game, although it featured a two-player mode and plenty of atmosphere.

Nexus was possibly more successful in

combining combat with plot. The only difficulty was that the plot was rather long and tortuous and you received no credit for the combat – rather the reverse, in fact. The more mayhem you created, the less your chances of completing the game successfully. The idea is to free your friend and smash a drugs ring. That is done by searching diligently for scraps of information. As there are many of them and it is very difficult to get them all, most people are happy to find where they can lay their hands on the stun gun and a steady supply of grenades and have some fun.

One of the better Fist clones was *Sai Combat*, or *Way of the Pointy Stick* as it is known. It has the key element of a good combat game – a good variety of moves. The successful player in Sai Combat will have to know most of the moves and their range. Each player is armed with a long stick. You can use it to aim blows at various parts of the opponent's anatomy. At any given range, one move will be particularly effective. Scoring is based on an energy scale. The fighting figures are large, with plenty of good animation.

Also worthy of honourable mention is *Way of the Tiger*, definitely one of the prettiest-looking of the combat games with a riot of superflous detail which all adds to the atmosphere. The game features you bashing your way past hordes of nastics. Fortunately, the lads approach you in time-honoured, one-at-a-time fashion. Each has more energy than the last and you have to beat hell out of them before your energy is exhausted.

The backgrounds are beautifully drawn and, as you move round, the background moves in perspective. Little blokes zip past in the background on litters, or the odd owl may flap past casually. The game loads in three parts. In each part the battle takes place amid different scenery and against different opposition. The third part is in the temple against a fearsome warrior armed with a Samuri sword.



Last Ninja.

So what of the future? Just as you thought every variation of strange men with no shoes beating up people had been exhausted, along comes *Fist II*. It is from the same author as *Fist I*, Greg Bennett, but if people were looking for a new epoch in games-playing, they were to be disappointed.

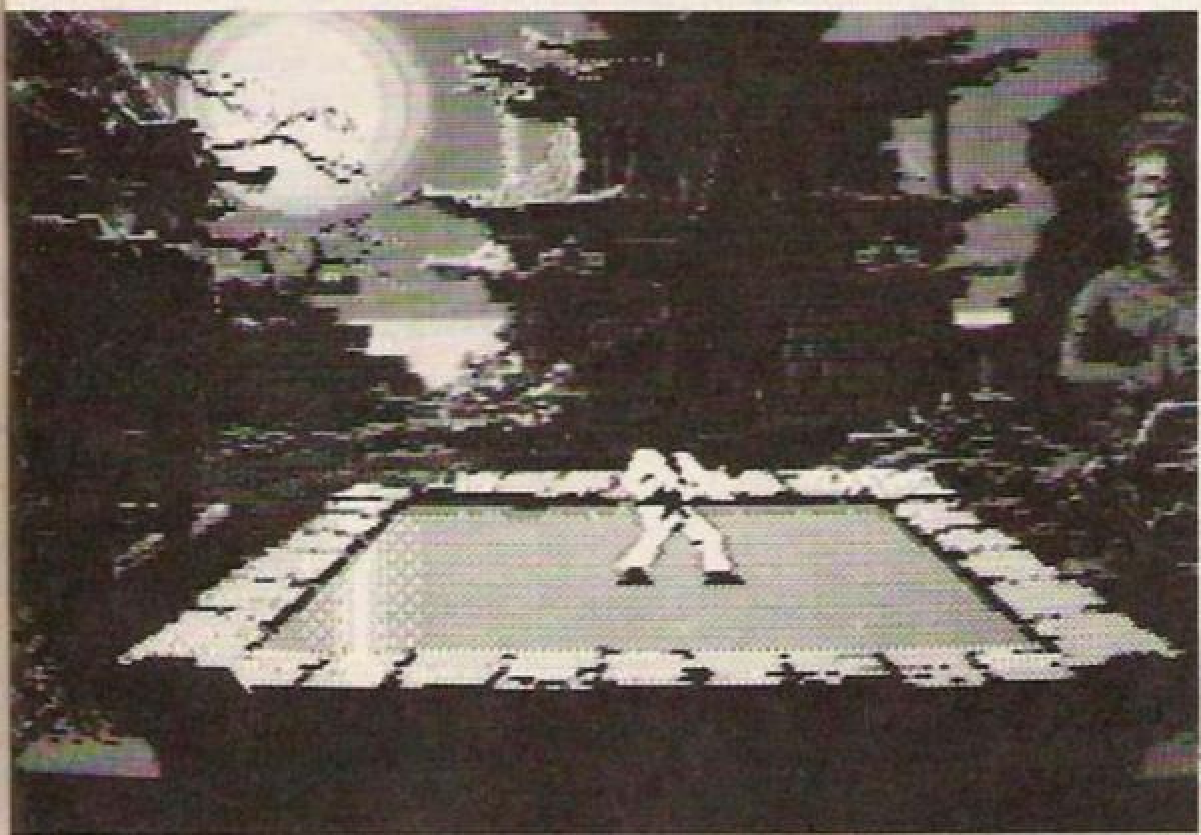
It almost seems as if Bennett has been too busy looking at other Fist clones to produce anything original. The game is an oddesy through temples and underground tunnels where you have to smash various-strength opponents but it suffers from the same weakness as Fist – the opponents are not so clever; one move, the forward punch, will dispose of all of them but there is always the bonus of a game of the original Fist with different backgrounds on the B side.

At Christmas it seems you will scarcely be able to move for the sight of flying feet and the crack of tortured bones from your computer. Almost everyone is preparing to throw a combat game into the ring. *Shao Lin's Road* is perhaps the most eagerly-awaited but, as yet, little has been seen of it.

Other titles include *Uchi Mata* from Martech, which is all about judo, and *Avenger*, which is the Gremlin Graphics follow-up to Way of the Tiger.

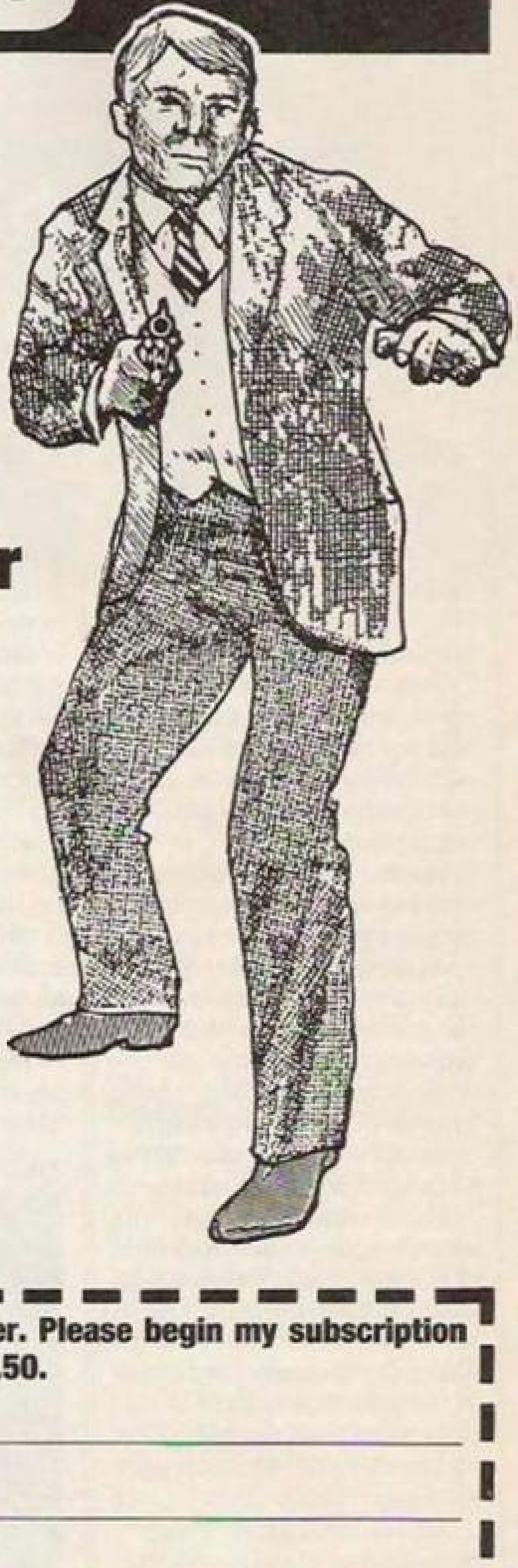
Despite the endless number of variations on a theme, combat games will continue to be popular for some time. They offer an exceptional combination of competition which is difficult to find anywhere else.

As each new one appears, the dedicated few will still yearn to reach perfection in the new brand of martial art.



Karate game.

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Your Computer covers all aspects of low-cost computing. Concentrating on hardware which costs less than £500, whether your interest is in games-playing on the Spectrum or choosing a data-base for the Amstrad PC, *Your Computer* will have articles full of useful information.
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The Expander expands

The Commodore Sound Expander system has already been bought by 15,000 people. The new software packages extend the scope of the system considerably. Tony Sacks has been looking at and listening to the new offerings.

Commodore shattered the tranquility of many a home about a year ago by introducing two musical add-ons for the 64/128. The *Sound Sampler* and *Sound Expander* packages freed Commodore owners from the sonic limitations of the built-in SID sound chip of the 64. They could explore sounds previously available only to synthesiser owners.

For the benefit of anyone who has been wearing ear-muffs for the last year, the Sampler is a device for recording real sounds in the computer memory, while the Expander is a module containing a synthesiser chip capable of producing eight channels of high-quality sound under control of the micro.

The Expander owes its precise, clear sounds to a form of musical synthesis known as frequency modulation. The software provided with the Expander demonstrated some of the potential of the FM system but gave the music-maker only limited access to its workings.

Gimmicky

The software offered 24 pre-set examples of the vast array of sounds which FM can produce and some of them were rather gimmicky. There was no way of altering the sounds or of creating new sounds from scratch.

Another limitation was that you could not store your precious musical compositions – you were limited to playing in real-time. Now, Music Sales, which developed the Expander for Commodore, has produced two software packages which explore far more of the potential of the system. At the same time the company has released a package which turns the Sampler into a drum machine.

The Expander packages are an Editor for the FM sounds and a Composer program which allows you to place notes on a conventional musical score and then to play is back through both the Expander and external musical instruments.

Although FM can produce strikingly clear and precise sounds, it has one disadvantage – it is extremely difficult to program new sounds. The Japanese synthesiser maker Yamaha has specialised in FM technology in its best-selling DX series of synthesisers but even Yamaha failed to crack the nut of making FM programming painless.

So when Musical Sales set about developing an easy-to-use sound editor for the Commodore Expander it was faced with a daunting task. It has, however, largely succeeded in its aim and has even managed to bring an element of fun into FM programming.

Clarinet

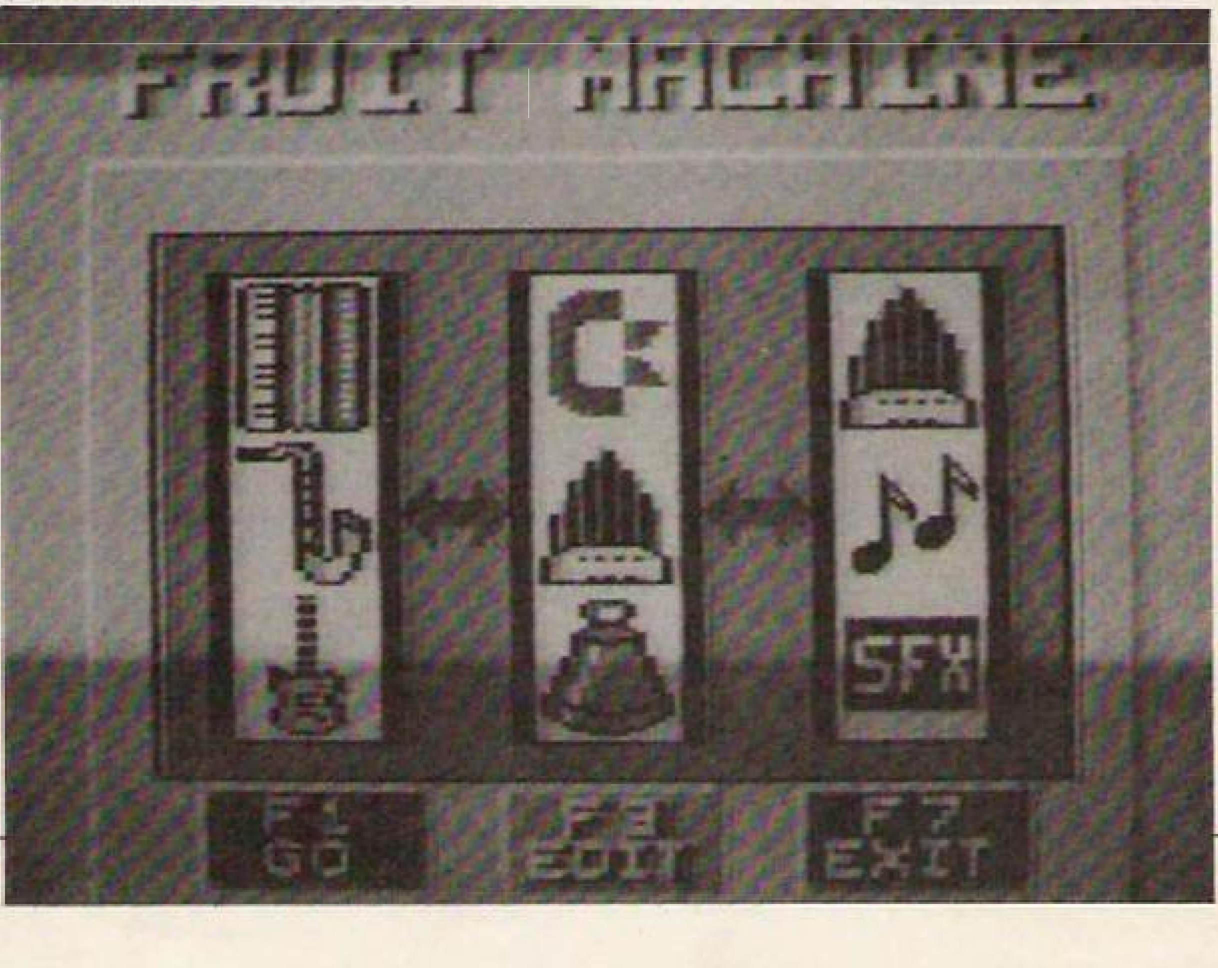
The Sound Editor package has five sections – Set-up, Edit Sounds, Drum Machine, Fruit Machine and Disc functions. The Set-up section adds 64 new pre-set sounds to the original Expander complement of 24. Most are highly usable, ranging from the esoteric, such as bass koto, to the more familiar – pianos, organs and string sounds. Particularly pleasing sounds include the clarinet, harp and tubular bells, an FM speciality. Less satisfactory are the bagpipes, blues guitar and steel drums.

The keyboard can be split so that different sounds appear in the upper and lower halves. Each half can be moved up or down an octave and the whole keyboard can be shifted several semi-tones either way.

The set-up page also selects Midi functions, allowing the Expander to control and be controlled by external instruments. Midi signals can be sent out on any or all of the 16 Midi channels and received similarly on any of the 16 channels. To use Midi you will need a Midi interface and Music Sales plans to market one soon for £39.99.

A Drum Machine page is designed to provide a simple percussive accompaniment for the musician. A choice of 10 synthetic drum kits is provided, each kit containing five instruments. They can be programmed either by tapping-out a rhythm on designated QWERTY keys or by placing points on an

Fruit machine.



instrument-versus-beat grid.

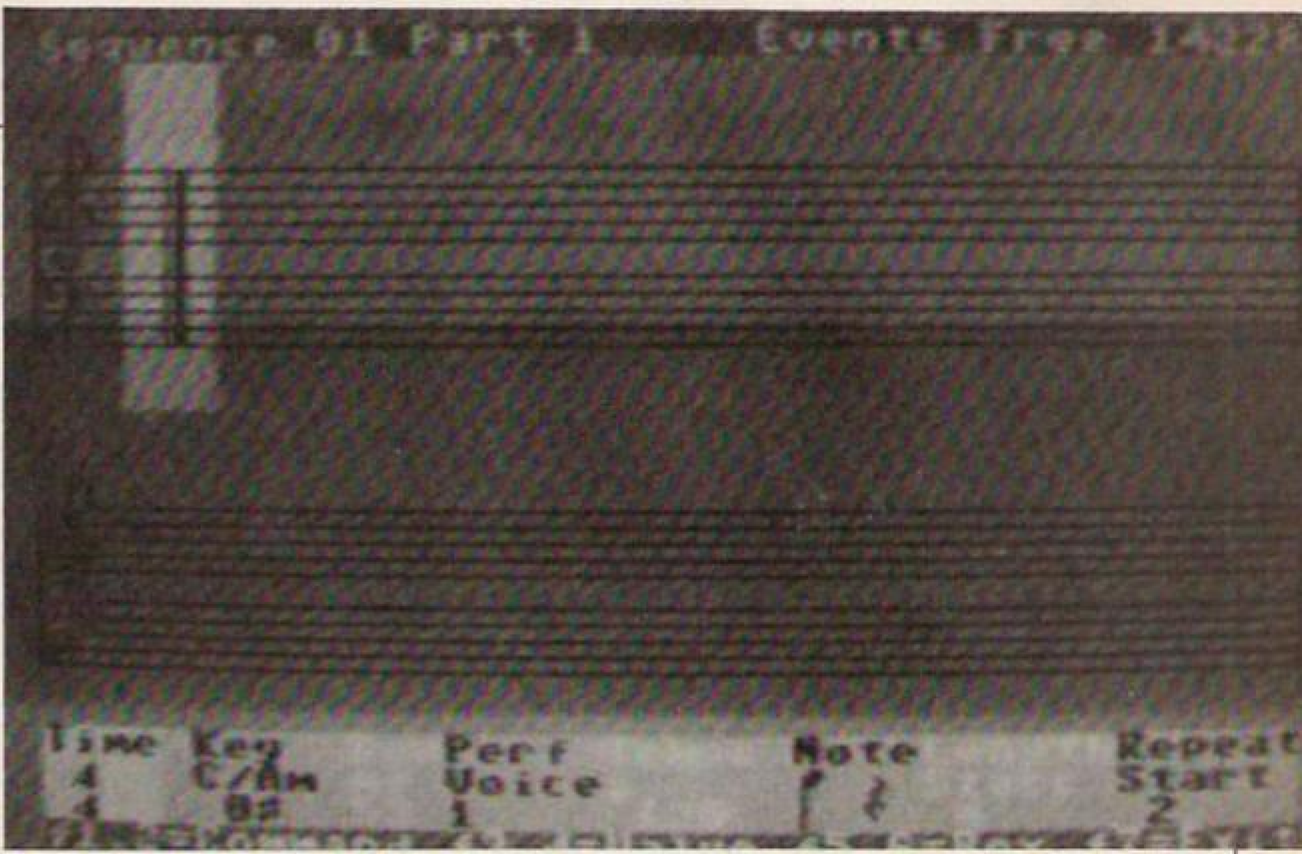
The drum machine should not be confused with a sampled drum simulator. The sounds are synthetic and have a distinctly unnatural appearance. Unlike proper drum simulators, you cannot assemble songs from strings of different rhythm patterns. Instead, the same 32-beat pattern repeats continuously. If you want you can switch off the drum machine and, considering that each drum sound robs you of one of your eight FM notes, you may well do so.

Pseudo-random

The next page, called Fruit Machine, is the Music Sales attempt to make FM programming fun. You are presented with a graphic representation of a one-armed bandit except that, instead of bananas and apples, you have musical symbols such as trumpets and drums. Press a function button and the cylinders start to spin. When they come to rest you have a new sound – it is as simple as that.

The Fruit Machine is a pseudo-random sound generator. If it was completely random many of the sounds would be non-musical. As it is, you get a usable sound from almost every nudge of the cylinders. Some of the sounds are inevitably flat and uninteresting but there are sufficient attractive noises to keep you nudging away. When you hit the jackpot you can produce some stunning sounds.

If the sound the fruit machine produces is not entirely to your liking you can return to the Edit Sound page and tinker with it. You are presented with 11 parameters which can be adjusted to alter the overall sound. Some of the parameters are self-explanatory – brightness and volume, for example – but others such as expander and FM link are less obvious. The envelope parameter offers a choice of 256 values with no indication of what effect each might produce and no apparent logical progression as you step through the envelope values.



Writing your own music.

The pre-production version of the software *Your Computer* examined had no instruction manual but apparently even that will not give much enlightenment about the meaning of the various parameters. Music Sales says that the aim is to keep editing as simple as possible and to avoid the technical jargon of FM but without some kind of guidance on the effects of changing the various parameters, you are left to feel your way by trial and error, a process which can be rather frustrating.

Screen display

In addition to editing Fruit Machine sounds, the Edit page can also be used to alter any of the 64 pre-set sounds. Once you are satisfied with your tailored sound you can give it a name and dump it to disc. The sounds can then be used in other Expander programs such as the original software or the new Composer package.

The Composer package allows you to place notes on an on-screen musical stave and to play back the composition via the expander or external instruments connected through the Midi interface or, for greatest effect, both. Nine parts, each with its own screen display, can play back simultaneously on different Midi channels or Expander voices. You can print-out your masterpiece as a conventional musical score if you wish.

Legato

The Composer package is a powerful tool which requires a knowledge of musical notation. Common scoring directions such as staccato, legato and dal seqno and dynamic values from ppp to fff can be specified and obeyed on playback.

The Composer package seems to be modelled closely on the Yamaha composer package for the CX5M computer-synthesiser although it is, in several ways, easier to use. Chords are displayed as such and there is none of the switching between note and command modes which can frustrate composing efforts on the Yamaha machine.

The Music Sales package suffers from one problem also found in the Yamaha package; because only one part is displayed at a time, it is difficult keeping track of what is happening on other tracks. It is, however, easy to move between the different parts for comparison and all the notes can be combined on one stave for a printout of the complete score.

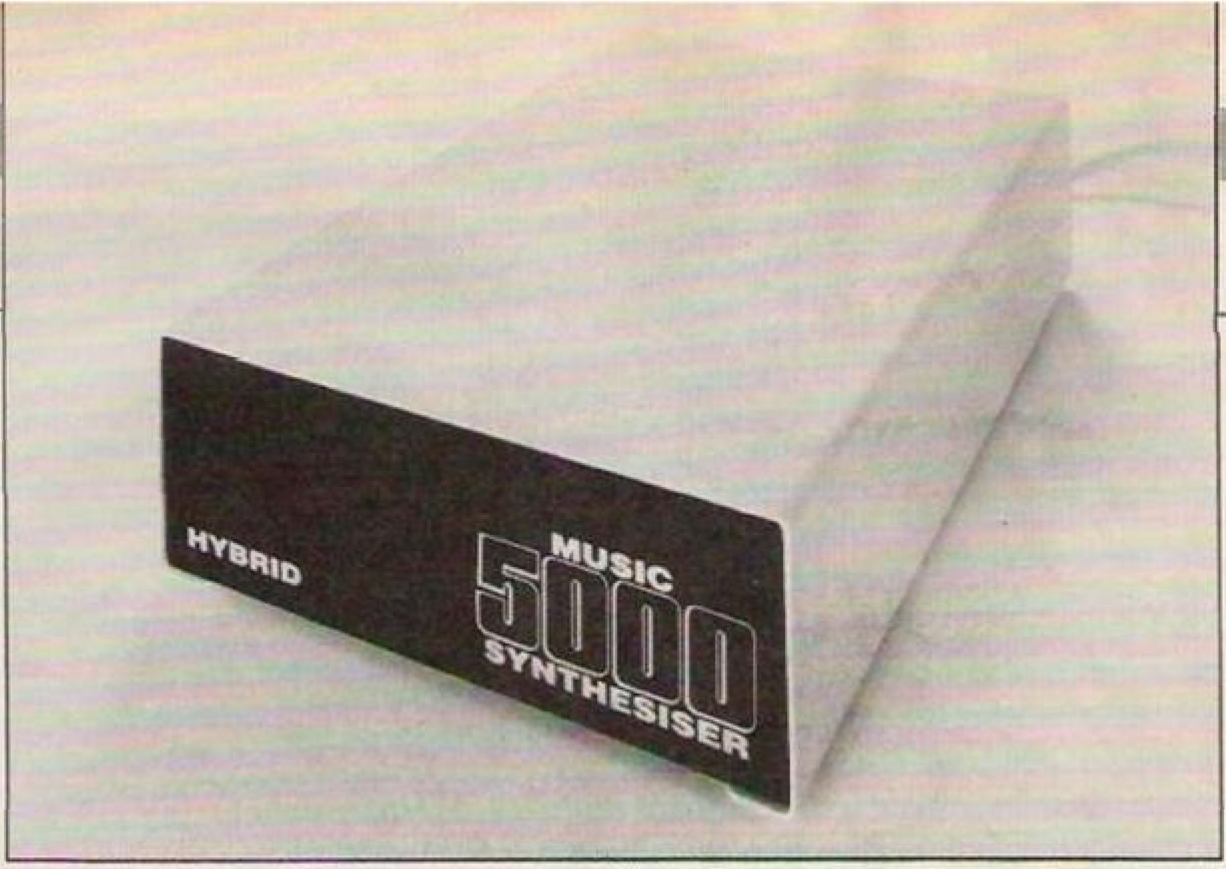
In addition to the main composing screen, the Music Sales package includes a Set-up page on which you can allocate Expander voices and Midi channels, but not particular voice numbers, to each part. There is a facility for de-tuning individual parts so that rich, reverberating sounds can be produced by playing back the same notes with the same voices on different parts, slightly de-tuned from one another.

Content

The Composer package is aimed at the competent musician, although non-musicians could probably use it by copying notes from sheet music. What the package will not do is store or transcribe music into notation as you play on the keyboard. Packages offering those functions may be produced later by Music Sales if there is sufficient demand. The Composer and Editing packages should keep you content until then.

At a cost of £24.99, either of the packages would be a bargain but Music Sales is bundling the two for that price. If you own an Expander, you cannot afford to do without them.

Music Sales is now looking at producing versions of the Expander for Amstrad CPC and PCW machines. There may even be a version for the Amstrad PC.



Sound extensions

Composing on the BBC has been revitalised by the release of two new products. Ian Waugh assesses their merits.

Music programs generally fall into one of two categories – those which use the computer internal sound chip and those which let you control an outboard musical device such as a synthesiser, usually through a Midi interface. We have looked at a number of both kinds in *Your Computer* and how varied they are.

Two years ago a third option became available for owners of BBC computers, the Music 500 Synthesiser, a box of tricks which was controlled and programmed completely from the host micro. It caused a stir at the time because the sounds it produced were undoubtedly spectacular and the price – then £199 – left keyboard-based synthesisers in the paddock.

Its main failing was its complexity. Waveforms, envelopes and musical pieces all had to be programmed in a new language called AMPLE – Advanced Music Production Language Environment – which was not particularly easy to understand. Those who made the effort found it incredibly powerful and versatile but it is probably true to say that the majority of owners did not get the best from their instruments.

User-friendly

Hybrid has now released the Music 5000 at £159.95 and it left a great impression on all who saw and heard it at the Acorn User Show. The hardware is fundamentally the same, although modifications have been made to the 1MHz bus to make it compatible with the Master and the B+. The 500 is guaranteed to work only with the BBC B but my 500 works well with my Master, so if you are thinking of buying a Master it may be wise to try it with your 500.

The major change is in the software and 500 owners can buy a Music 500 upgrade pack for £69 consisting of an Ample ROM, a User Guide and Studio 5000 disc. It is important to realise, however, that it will not make a non-compatible 500 compatible. The Music 5000 is distributed by Peartree Computers and the upgrade is available from Hybrid.

So, if the sounds are the same, what is the difference? That is immediately apparent on booting the Studio 5000 disc. In a word, user-friendly. The Studio 5000 main menu gives easy access to three new front-end modules. They are loaded into the computer when required and as new modules are developed – e.g., keyboard control and Midi modules – you will be able to access them in the same way. A set of impressive demonstration tunes has been provided and you can run through them by pressing a key and loading a jukebox module.

The first new module is the Mixing Desk, a graphic representation in mode 7 of an eight-channel mixing desk complete with faders, pan-pots and instrument assignments. When you load a piece of music try some of the demonstration tunes has the panel shows the names and settings of all the instruments. You can alter everything as the music plays, changing stereo positions, volumes and even the instruments. It is great fun and when you manage finally to tear yourself away you will discover other things the Desk can do, such as transpose a piece and change the tempo. You can save mixes, too.

The problem with many music programs is that they require the musician to learn new methods of notation. They all have their pros and cons but most musicians are familiar with traditional notation; it is, after all, the most widely-used. The Staff Editor is for those millions.

Notes are entered on the staff in a way similar to that used by the Island Logic The Music System. The 5000 Editor, however, goes much further and supports almost every aspect of notational convention. You can even enter chords but they step across the staff rather than lining-up vertically.

Legato and staccato can be programmed by altering the gate time of the note, i.e., for how long it is held down, and you can set dynamics – loudness – for accents. Bar lines are optional but if you use them with a time signature – optional again – the Editor will check for correct bar lengths. It can be used to enter percussion scores, too, of up to six instruments.

The Staff Editor is a breakthrough in music scoring for those who prefer traditional notation. Not many dedicated music or Midi packages use traditional notation and the ones which do have nothing like this amount of detail. The Editor is invaluable, too, for entering music from written scores.

The third module is the Notepad, a framework which houses the standard Ample music notation which will be familiar to 500 owners. You can move freely round the Notepad screen with the cursor keys and editing is therefore a very easy business. The Notepad is used to enter pieces of music in Ample notation and to define new instruments.

The basic unit of the Ample language is the word. It can be an instrument definition, a music instruction or a sequence of notes. The syntax is similar to Reverse Polish Notation so to load and run a program you would enter:

```
"tune" LOAD RUN
```

Initially at least, you are unlikely to need anything more complicated so there is no need to worry about learning a new language; the new modules take the hard work out of it.

In Ample, notes are defined as a duration, octave number and a note name. An upper-case note name indicates a rise in pitch from the last note, a lower-case note name indicates a fall in pitch. The exponential character (^) is used for a rest and notes can be lengthened by adding

backslash (/) characters. For example, the first six bars of God Save the Queen would look like this:

24, 0: G/G/A/ +f//GA/ B/B/C/ B//ag/ A/g/+f/ G/////

'24,' is the note length, a quaver, '0:' is the octave number and the letters are notes. The + before the f indicates a sharp and the spaces make it easy to read by dividing the piece into bars.

Ample supports a full complement of music facilities and you can do many things in the Notepad which would not otherwise be possible or practicable. Echo produces a wide range of effects, including a subtle reverberation. Repeating echos can be de-tuned, transposed, altered in volume and panned to different stereo positions.

For really fine control, you can program gradual changes in tempo and volume and autopan and glide effects are possible, too. The Music 5000 is capable of far more subtlety than most Midi programs and should help placate those who claim computer music is static and sterile. It need not be and all this is possible because the music is under software control.

At the press of a function key, the Notepad is ready to create new instruments. The Music 500 software returned you to absolute basics and you had to begin by defining a waveform and amplitude and pitch envelopes. The whole process could take a long time. The new software has done most of the work for you by giving you 14 waveforms, 17 amplitude envelopes and 17 pitch envelopes.

That is a reasonable number of combinations. For more variation you can add sync, ring and frequency modulation to them and voices can be transposed, de-tuned and given different stereo positions. Voices normally are created using two of the 16 sound channels but you can use as many for one voice as you wish.

Table 1.

Music 5000 specifications

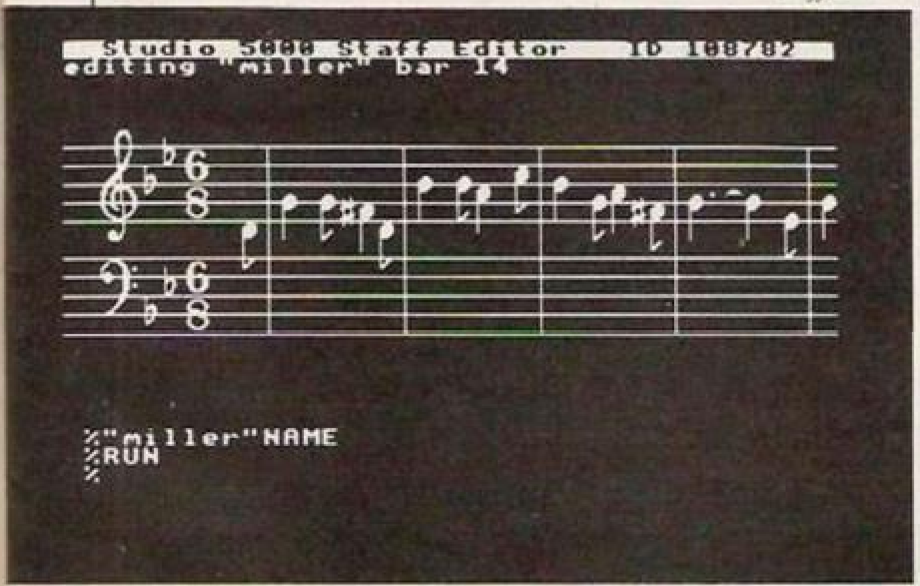
16	Channels	Independent control of volume, pitch, stereo position and modulation.
8	Voices	Independent control of volume, pitch, stereo position and modulation.
14	Waveforms	Extendable. Selectable by channel.
17	Pitch envelopes	Selectable for each channel.
17	Amplitude envelopes	Selectable for each channel.
14	Pre-set Instruments	Another 25 definitions in manual.
7	Stereo positions	
	Modulation	Ring, frequency, sync.

Table 2.

Modules

Notepad	Screen editor for AMPLE music notation.
Panel	Instrument editor.
Mixing desk	8-channel. Individual faders, pan, instrument selection.
Staff editor	Note entry in traditional notation.
Special effects	Echo, reverb, autopanning, glide.

Staff Editor.



At the back of the User Guide are illustrations of the waveforms and envelopes which help you understand what the sounds are doing and there are details of 25 other instruments for you to enter.

Seasoned 500 users will not have the same degree of control over the sound but that is unlikely to worry most users; the new system is still extremely versatile and, above all, easy to use. An envelope and waveform editor is being developed for those who would delve further into these things.

The new User Guide is a 100 percent improvement on the Music 500 manual. It will have you mixing and editing and notating in a very short time. As with any piece of complex software, there are still items which will require a little reference and study but the new modules and instructions generally make everything fairly straightforward.

An advanced Ample Programmers' Guide is being written for those who want to know more about this fascinating instrument and we still await the long-promised Midi interface which would take the 5000 into the big league. If you are the owner of a rather dusty and neglected Music 500, the upgrade pack will re-kindle your interest. If you have not dabbled previously and are now contemplating the 5000, it can be recommended on all kinds of levels. It is fun and educational to play with the Mixing Desk; it is easy to enter simple written music into the Staff Editor and it is fascinating to create new instruments in the Notepad. The more experienced and adventurous musician will love it.

The Music 5000 is undoubtedly a most powerful musical instrument and a welcome addition to the BBC micro. To discover its potential, send for a demonstration audio cassette from Peartree at £2.95.

ADDRESSES

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Cambridgeshire PE18 6BD.
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Hybrid Technology Ltd.,
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Robert Davies Court,
Nuffield Road,
Cambridge CB4 1TP.
Tel: 0223 316910

GEM ON THE 1512

K. D. Peel examines the environment in which the new Amstrad makes life a great deal simpler.

It is a pity that the GEM applications supplied with the Amstrad PC, such as GEM Paint, are so difficult to get up and running for beginners to computing. The problem lies in supplying the applications spread over a number of discs, requiring the user to create a set of working discs – scarcely the switch on, insert disc, run philosophy of the previous Amstrads.

The Paint screen provides drop-down menus and a pictorial representation on those menu items which would be difficult to describe. The desk-top accessories are available through the Paint menu.

GEM Paint uses combinations of lines and shapes, filling the text to construct a picture. The user may use the tools to move, copy, magnify and modify parts of the screen. The file menu enables the user to Open a file for change, Close the file for printing, Abandon the current changes and Quit the Paint application.

GEM Output outputs a batch of up to 36 ASCII text or graphics files in either foreground or background. The files may be generated by Snapshot, GEM Paint or a word processor.

The two previous articles demonstrate the approach taken from about 1980 to writing operating systems for computers, entering commands as lines of text which the user has to enter correctly in terms of spelling, syntax and usage.

As the standard size of computer memory available has increased, so operating system software writers have looked for a simpler and less error-prone method for users to communicate with the computer. The current trend is towards providing the user with a pictorial representation of a desk-top, containing further pictures of items on the desk, which represent the writing paper, folders, filing cabinet and tools. Items are selected from the desk-top by manoeuvring a pointer on the screen through the use of a hand-held device called a mouse.

GEM Desktop screen layout of commands

Menu bar

FILE	OPTIONS	ARRANGE	DESKTOP
Open	Install disc drive	Show as text	Snapshot
Info/Rename	Configure application		Calculator
		Sort by name	Clock
Delete	Set preferences	Sort by type	Print spooler
Format	Save desktop	Sort by size	
	Enter DOS commands	Sort by date	
To Output			
Exit to DOS			

Drop-down menus

The GEM user can work on a number of windows, each of which represents a portion of the desk-top – in a pile if need be. The top window is the active window in which the user may run an application program, copy files, print files or send data to the serial port.

GEM desktop may be run from DOS Plus or MS-DOS and return to them from the GEM Desktop may be run from DOS Plus or MS-DOS and return to them from the GEM Desktop menu but in its standard Amstrad PC form GEM Desktop is run from DOS Plus.

The use of GEM is intuitive. By that I mean that the question-and-answer dialogue with the menus should be self-evident for simple functions, although the details will still have to be learned for anything not straightforward.

The command choice is by selection from the apprpriate menu and parameters chosen from further menus, which avoids the problem of remembering the syntax, or from a dialogue box, where usually the user enters filenames or merely replies to a cancel or O'K prompt by a single keypress or mouse button click.

One more sub-menu is used by the foregoing commands:

Edit menu	
Add name . . .	Adds a filename to the output list.
Duplicate name . . .	Duplicates highlighted list entry.
Delete name	Deletes highlighted list entry.

Most of the options present a dialogue box to display the current settings and permit changes to be made:

GEM-based Basic2 screen layout of commands.

Unfortunately starting Basic from scratch in a single-drive Amstrad PC is tedious. To work with Basic2 the user initially has to:

Start the system with the GEM start-up disc	**disc 2**
Load Basic2	**disc 3**
Load GEM desk-top from another disc	**disc 3**

The price paid for the graphics approach of GEM is the amount of memory consumed by the operating systems. It is magnified in the Amstrad PC environment which, unlike other popular computers, does not hold the operating system in ROM and therefore loses valuable working RAM space.

To provide the user with as much space as possible for applications, some desk-top accessories are not loaded into memory when the GEM desktop is brought up. Even more memory can be made available to applications – an extra 30K – by ensuring that none of the desk-top accessories is loaded into memory.

GEM Output command summary

File menu	
New	Clear the current output list for new start.
Open . . .	Open output list selected.
Close	Close current output list.
Save	Over-write existing file with new version.
Save As . . .	Save current .LIS with new filename.
Get Options . . .	Get options from .opt file – default .opt.
Save Options . . .	Save options in filename.opt file.
Start Output . . .	Start outputting current list of files.
Quit	Abort GEM Output and return to calling prog.
Options menu	Dialog box selectable options
Screen . . .	Wait for key, 2,5,10,20 sec$., cycle on/off.
Printer . . .	Full scale/best fit, start & end form feed centring and fore/background printing.
Plotter . . .	Full-scale/best fit, centring picture up, down, left, right.
Camera film . . .	Film-type Polaroid 669/691, Polachrome, Ektachrome 100, Agfachrome 100 Fujichrome 100 and intensity +3 light / —3 dark print film —3 light / +3 dark slide film
Camera colour . . .	Enables each of the 16 basic colours to be adjusted for colour intensity or the actual colour output.
Make default . . .	Save current settings as default.opt.

Snapshot saves the current screen in such a form that the GEM Paint applications can accept the file as input or the GEM Output application can dump it to a printer or camera. The sub-menus provided by clicking the snapshot text in the desk-top menus present a picture of a camera and a question mark. Clicking the question mark displays a dialogue box containing brief instructions how to operate the snapshot accessory.

The calculator accessory provides the standard functions of a typical pocket calculator – plus, minus, divide, multiply, percent and a memory register.

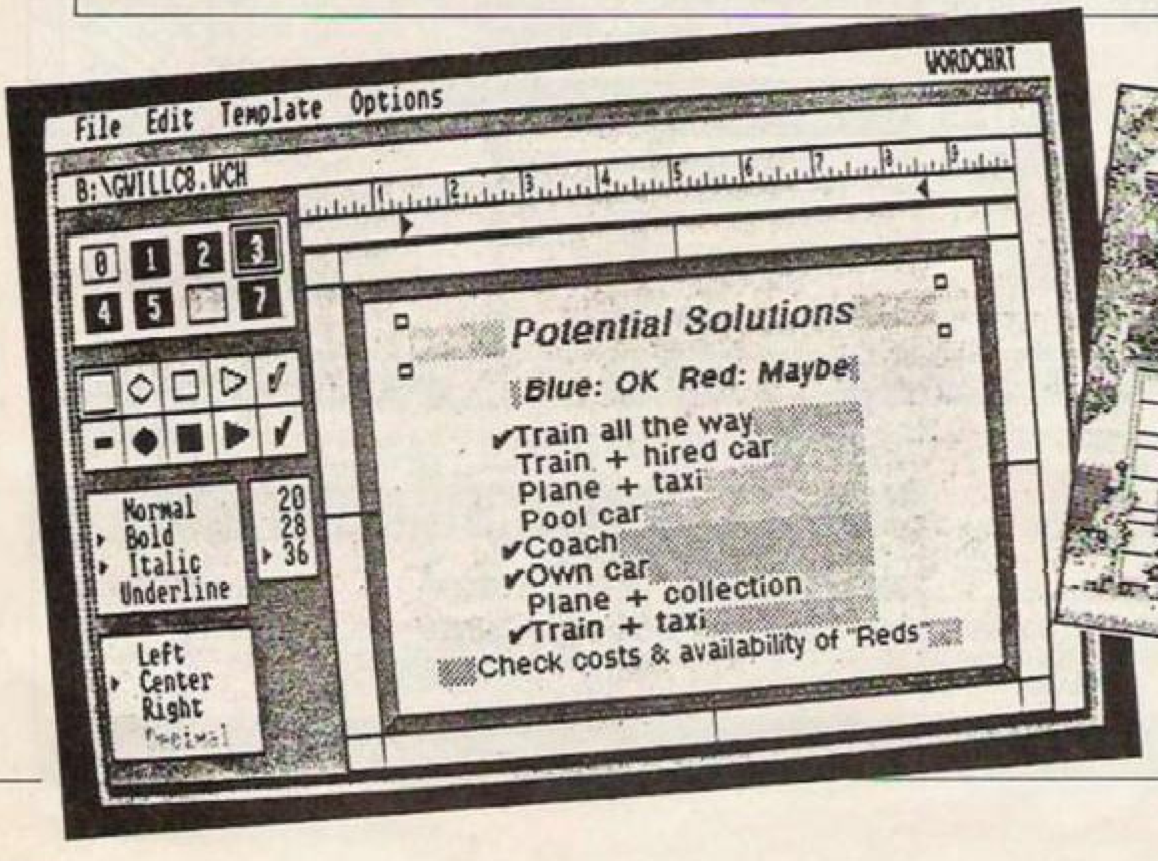
The clock provides an alarm which can be set and is active during the GEM session but once the user leaves GEM Desktop by the use of the quit command, the settings are lost.

Clicking Print Spooler puts up a simplified GEM Output dialogue box with a list of filenames from which the user selects files for printing.

GEM Basic command summary

File		
Load . . .	**Load selected Basic program file from disc.**	
Save . . .	**Save Basic program to disc as *filename*.**	
Quit	**Exit Basic2 and return to GEM Desktop.**	
Program		
Run	**Run current Basic2 program**	**(RUN or F9).**
Stop	**Stop current program**	**(STOP or Ctrl_C).**
Continue	**Resume stopped program**	**(CONT or F7).**
Edit	**Edit current program (EDIT or *click edit window*).**	
List	**List current program to printer.**	
New	**Delete current program and allow new start.**	
Angles in . . .	**Select degrees or radians via dialog box.**	
Edit		
Exit Edit	**Return control to dialogue window**	**(F10)**
Start area	**Mark start) Mark a block of text for**	**(F1)**
End area	**end) further processing**	**(F1)**
Cancel area	**Cancels marks set**	**(F2)**
Copy area	**Copy block to current cursor position**	**(F3)**
Move area	**Delete block and copy to current cursor position**	**(F4)**
Delete area	**Delete block**	**(F5)**
Insert off	**Toggle insert/overwrite mode**	**(INS)**
Renumber	**Renumber program lines as per dialogue box setting (Only numbered lines are renumbered)**	
Fonts		
1 System	**\ Font style and size are chosen by clicking**	
2-4 Loadable	**: the option causing selection to be arrowed**	
7-72 Point	**/**	
	Different font styles and sizes are loaded by the ASSIGN.SYS file and are available only to the graphics screen Results-1	
Thickened	**\ The character effects is toggled on/off by**	

Lightened	**: clicking the selection. The settings are**
Skewed	**: used for all subsequent graphic screen**
Underlined	**/ output until changed.**
Colours	**Note the way this application spells colour**
0-15 Text	**\ Different colour (or monochrome intensity)**
0-15 Graphics	**/ used to write to the screens.**
Patterns	
0-38 Patterns	**The default graphics screen fill pattern**
Lines	
1-6 line style	**Choice of six styles from continuous thru dotted.**
Thickness	**Choice of four line thicknesses.**
End style	**Shoice of three styles for each end of the line.**
	Where multiple options are provided in line thicknesses and end styles, not all options are available to each line thickness – depicted by light coloured text.
Windows	
**Show Results-1 **	
Hide Results-1 :	
Show Results-2	**: To make a specific window active and to**
Hide Results-2	**: close others. Those windows closed – hide –**
Show Edit	**: are not displayed but may still receive**
Hide Edit	**: program output.**
Show Dialogue :	
Hide Dialogue	**/**
Basic2	
Desk-top accessories	
Snapshot	****
Calculator	**: The accessories may be removed from memory**
Clock	**: if the user requires more memory for the**
Print Spooler	**/ Basic2 program – see following section.**





Explaining parsers

Roger Garrett describes the role of a parser in text adventure games.

Last month we saw the long-awaited release of *The Pawn* so I thought it might be a good idea to try to explain what makes games like The Pawn and Infocom adventures special. In a word it is the parser but what does a parser do? In the 1950s, artificial intelligence research at Massachusetts Institute of Technology focused on natural language systems which would enable computers to manipulate human knowledge and information. Applications dealt with things like language translation.

The heart of the process was the parser, a sub-routine which resolved a sentence like "Nyet, comrade" into its grammatical parts so that another part of the program could convert it quickly into "No way, Jose."

Never acceptable

Crowther's parser was the basic verb/noun type, adopted by many adventure writers like Scott Adams. It was never truly an acceptable way of inputting commands – who would say "Go Door" to go through a door into another room? Yet that form of command became the acceptable method in the majority of adventure games.

That acceptable method, however, created many frustrating problems for the would-be adventurer. We found quickly that it was not the problems which stumped us. More often it was trying to find the correct word to use in its proper context. Another frustrating situation arises when an adventurer discovers he cannot use a word the game has just used in a description. The game may say "You see a warty Ogre" but when you type-in "Kill the warty Ogre" the program responds "I don't know the word 'warty'." That is because the original message "You see a warty Ogre" is stored in the program database, which holds all the descriptive passages but is not part of the game's vocabulary, which is stored in another section called the word tables.

Comparison

The parser works by comparing each word in your command to those in the word tables, not those in the database of descriptive text. In other words, even the best parser does not always have the foggiest idea what it just said.

Another of the parser's jobs is error-handling. If you say "Press the button" and the program says "Please re-phrase that" you do not know whether it does not understand the word 'Press' or the word 'Button'. The more courteous parsers usually identify the unknown word, sparing the player at least some of the frustrations associated with playing adventures.

It goes without saying that the bigger the vocabulary the better the game-play because modern adventures have reasonably large vocabularies – the fewer "snyomn searches" the player will have to conduct to find the proper words to solve the puzzle. The bigger the vocabulary the more memory used, so most large adventures were available only to disc drive owners.

Astounding

It seemed that no software house wanted to try to improve the lot of the adventurer until Level 9 released *Worm in Paradise* and astounded most ardent adventure freaks. At last we saw the advent of an adventure capable of handling full sentences with a vocabulary of more than 1,000 words, graphics and multi-tasking but, more important, it was cassette-based. Text descriptions were not so long as disc-based games but it gave non-disc drive owners a taste of what true adventuring was about.

INFOCOM CORNER

A number of readers seem to be puzzled by the Screening Door in *HHGG*. R. Harrison is stuck at that point. The important thing to remember is that you cannot enter the door until you have accumulated 200 points. Then you must prove to the door that you are a superior person by having in your possession the 'Tea' and 'No-Tea'. Only then can you enter but remember to drink the 'Tea' before you do. On entering you will be asked if you are carrying a certain object. If you are, you can open the hatch.

The sneezing Ogre in *Spellbreaker* is causing some difficulty. The answer is to visit the 'Meadow', pull the weed you find there, then return to the cave and "Plant the Weed".

For some amusing responses in *Zork II*, have you tried 'putting a coin in the well and making a wish' or 'giving a treasure to the Dragon and finding it afterwards'? If you are really brave try 'squeezing the Dragon'.

HELPFUL HINTS

Village of Lost Souls
To find the Chalice, Examine Nettles on the bank of the swift-running river.
To find the Rusty Sword, Examine Grass where the road bends.

Adventure Quest
To get rid of Orcs surrounding the Stone Tower, Unlock Snowman, Take Snowman, Down 3 times, Push Rocks.
To open Cave Door in Gully, say 'Open Seseme'.

Valkyrie 17
To leave Hotel, at end of Corridor Open Window, Go Out, South, In, Tie Rope.
To get rid of Butcher – Give Box.

Philosopher's Stone
To go past Cobra, Tie Mirror (with twine), Lower Mirror.
To keep door of secret room open, roll Amphora twice.

Emerald Isle
To pass Logging machine, Wear armband.
To go down from Monument, examine Monument, Insert Fence Post.

The 10 most widely-played adventures ffrom August 25 to September 21 were: The Boggit, Very Big Cave Adventure, See Kaa Of Assiah, Valkyrie 17, Zzzz, Fantastic Four, Castle Of Terror, The Helm, Mordon's Quest, Return To Eden.

Briefly . . .

The new *Your Computer* Helpline service is handling 150 calls a week, which is very impressive. The service is completely voluntary, so please spare a thought – do not telephone before 7pm or after 9pm and please do not telephone at the weekend.

Most members of Adventurers Club Ltd. will have realised that it has disbanded but Rita Maloney of Liverpool informs me that her local paper, the *Liverpool Echo,* displayed a recent advertisement for the club. Be warned – do not send money to ACL.

Helpline Service

If you are in deep despair or cannot find that elusive key, help is only a telephone call away. The Adventureline Helpliners are Jackie on 061 339 0092 and Geoff on 0695 73141, available five days a week from 7pm to 9pm. My thanks this month to Mike Maule for his compilation of hints.

Last month's review of *Dracula* stated that it would be text-only but CRL in its wisdom has decided to include graphics; not any old type, but digitalised graphics. I cannot wait to see it.

BUGSY

► *Spectrum/CBM64/Amstrad CPC*
● *CRL Group*
● *Graphic Adventure*
● *£7.95*

One thing about being an adventure games player is that we tend to adopt some strange roles in our never-ending quests. Whether it is a Conan-type warrior or an apprentice magician there is always a new role for us to adopt but playing the part of a three-foot blue rabbit is not exactly my idea of adventuring. Perhaps St. Brides, which is noted for taking a gentle poke at people, thinks that anybody who plays adventures is a blue rabbit.

To release this game so soon after *Very Big Cave* is, in my opinion, an unwise move or, because of the tremendous success of VBC, a good piece of marketing on the part of CRL. Whichever way you look at it, the game is not up to the standard which St. Brides has set itself. *Bugsy* is a three-foot blue rabbit who wants to become the big Crimelord. Your part is to guide Bugsy in his attempts to achieve his ambition.

St. Brides has attempted to create an original adventure. Unfortunately we have seen it all before. The only new feature is what can only be classed as a talk-back mode. On meeting another character we can input "Talk to Boy", a sub-menu is then displayed with such commands as Greet, Insult, Sweet-Talk. A letter defines which option to use, so if we want to insult the boy we press the appropriate letter and are rewarded with such sparkling wit as "Know somet'in' kid? Yer as stoopid as ya look, an' dat's sayin somet'in'". The boy replies "Well, I ain't as stoopid as you look".

GRAPHICS
●●●
ATMOSPHERE
●
ORIGINALITY
None
PLAYABILITY
●
VALUE FOR MONEY
●●
OVERALL
●●

I have a faint suspicion the game is aimed at the under-10 adventurers or is that being unkind to the under-10s? I do not like to criticise adventures but I also dislike seeing well-known companies putting out games purely for commercial reasons. St. Brides has written some really original games so it is a pity it could not continue in the same vein instead of writing what I can only define as a *Mugsy* rip-off. I think this rabbit should have remained in his burrow.

H.R.H.

► *Spectrum 48K*
● *8th Day Software*
● *Graphic Adventure*
● *£6.95*

Those who have played 8th Day adventures will know that the writer and owner, Mike White, has always tried to write adventures with a difference. Earlier works, which include gems like *Quann Tulla, Cuddles* and *Faerie* brought a certain degree of freshness to adventure games.

The latest release, *H.R.H.*, is, to say the least, somewhat different but whether it will have the same reception as those earlier ones is difficult to say. The plot of the new game centres on a Giro cheque. What has happened is that you have received the Queen's cheque instead of your own, so you can only surmise that yours has been sent to the Queen. Being an upstanding citizen, you must return the Giro to its rightful owner. What is not clear is the way in which you must do so.

Your quest will take you out and about in London. There are certain problems to solve which will then lead to other parts of the game but that is where the difficulty arises. If you do not know various things about the Royals – for instance, if you try to give Princess Margaret a cigarette she refuses, mainly because she is trying in real life to stop smoking, so its only by continually trying that she eventually takes it. I found this problem a little obscure but it is essential, or she will not give you what you need – in this case a spanner.



The adventure tends to be a little complicated and there were many times when I was completely baffled about what was happening or even what I was supposed to be doing. White has tried to make the game as funny as possible but I must admit some of the humour failed to make any impression on me.

Overall the game is high on original content. Text descriptions are up to the usual 8th Day standard, setting the scene well as you wander round the many varied locations. Also included are graphics – not the best in the world I hasten to add, but adequate.

GRAPHICS
●●
ATMOSPHERE
●●●
PLAYABILITY
●●●
VALUE FOR MONEY
●●●
ORIGINALITY
●●●●
OVERALL
●●●

I feel certain that the game will cause a certain amount of controversy because of the nature of its content but 8th Day must be congratulated. In one sense, at least, it is trying to do something different and not just staying with tried and tested formulae like some other companies.

AFTERSHOCK

▶ *Amstrad CPC/PCW/CBM 64/ Spectrum 48/128*
● *Interceptor Software*
● *Graphic/Text Adventure*
● *£7.95*

Interceptor Software has been responsible for many adventurers beating their heads and crying for help while playing some of its earlier releases – *Heros Of Karn, Warlord* – but in *Aftershock* the problems and overall atmosphere generated in the earlier games seem to be missing. The idea of the game is sound enough. An earthquake has devastated the city. That was bad but not so bad as what is about to happen – a nuclear reactor is about to explode.

GRAPHICS
●●●●●
ATMOSPHERE
●●●
PLAYABILITY
●●●
VALUE FOR MONEY
●●
OVERALL
●●●



After being informed by your site foreman that a shut-off valve needs repairing and because it is potentially so dangerous nobody is prepared to stay around, your job, in time-honoured fashion, is to make your way from your office across the burnt and wreckage-strewn streets and finally repair the valve, saving the world and winning the game.

A city recovering from a massive earthquake and with the added danger of a nuclear disaster is a good idea but I feel the author has tended to be a little sterile in his descriptions of the ravaged city. The text seems to be bland and, after a time, becomes boring.

The problems are not difficult – more a case of find the correct word than solving a problem. In the beginning you must leave your office premises. A fire is raging below, so it is during a quick examination of the lift that you discover a panel in the ceiling. Returning to your office, you grab the chair and return to the lift. Standing on the chair enables you to remove the panel and climb out of the lift. Not very original, is it?

The adventure will appeal to novice adventurers and the graphics, some animated – one which portrays a hand poking from under a load of rocks was unnerving, especially when the hand moved – drawn by Terry Greer are excellent. Unfortunately graphics do not make an adventure.

QUESTRON

▶ *CBM64 + DD*
● *Strategic Simulations/U.S. Gold*
● *Role-playing Adventure*
● *£14.95*

The recent release from SSI/U.S. Gold, *Questron*, first released in 1984 in the U.S., is a game tending to show its age. Our American cousins have already seen and played *Questron 3*. Comparing the game to the likes of *Phantasy* and the Ultima series is like comparing chalk and cheese. Granted, Questron is a big game; there is plenty to do and explore but I became increasingly bored as I marched round fighting matchstick monsters and indeterminable blobs of colour.

Questron is set in the fantasy Questron Empire. Life is not so pleasant as it used to be, due no doubt to the presence of the evil sorceror Mantor, who happens to possess the Great Book Of Evil. The land you love is under attack from his murderous legions of hideous monsters, both matchstick and blob variety. Everything seems hopeless until one day the king summons you to his throne room and proclaims you Defender of the Realm.

Rather strange, you think, mainly because until that great honour was bestowed on you the only claim to fame for which you could account was growing the biggest cabbage in your quarter-acre of peasants' land.

Anyway, off you go with some food, gold and hit points to explore the land and eventually defeat old Mantor. That is where the game slows. Instead of the usual type of slay monster/find gold game the writers decided to enter an element of chance by introducing various forms of betting games. So on entering one of the numerous towns/cathedrals/villages you can take part in roulette or dice and probably win some money and buy a sword so that you can defind yourself from Mike Matchstick and Billy Blob. Unfortunately if you lose there is no way of being able to get a sword – or anything else for that matter.

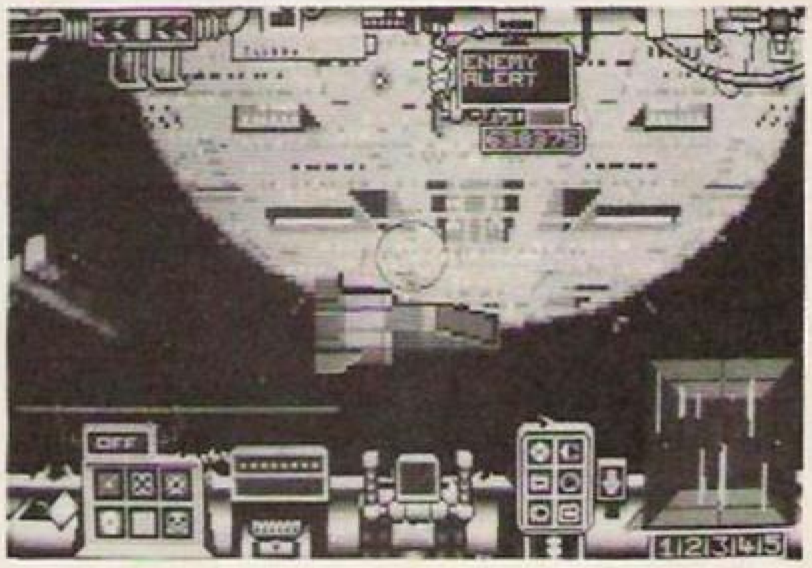
I have no doubt it would have been a very good game in 1984 but, as we all know, RPGs are much more sophisticated now, so Questron is really a non-starter.

GRAPHICS
●●●
ATMOSPHERE
●●
PLAYABILITY
●●
VALUE FOR MONEY
●●
OVERALL
●●



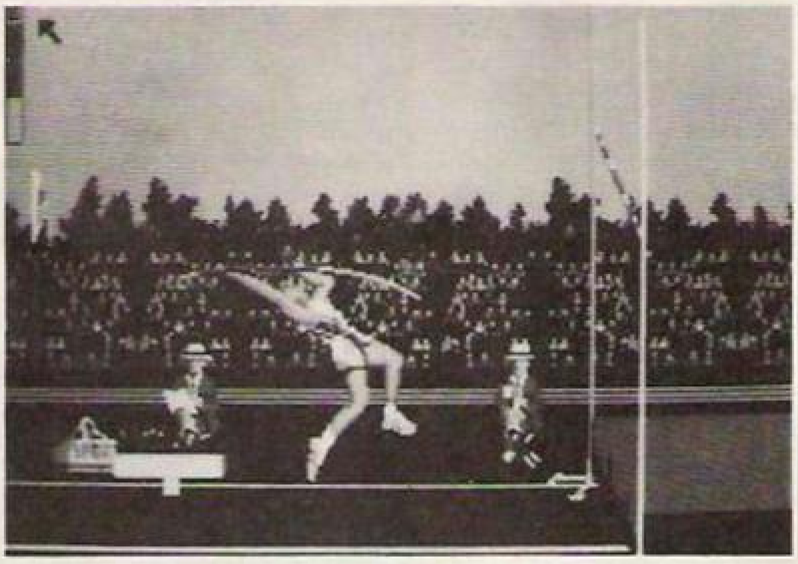
PSYGNOSIS

Following the unprecedented success of Brataccas, Psygnosis are pleased to announce the launch of two new products for the colour versions of the Atari ST and the 512k Amiga.



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GUIDE TO THIS MONTH'S REVIEWS

SPECTRUM
Firelord
Great Escape
Lightforce

COMMODORE
Uchi Mata
Kettle
Ace of Aces
Superstar Ping Pong
Antiriad

AMSTRAD
Lightforce
Kettle

ATARI
Starglider
Arena

VARIOUS
Fist II

Software Shortlist

**Each of the games reviewed in Software Shortlist has been reviewed extensively by our team of reviewers.
We do not include reviews of unfinished products in this section of *Your Computer*; they are the games you can buy now or in the near future.
See the Software News and Preview features for advance news of games being developed.**

Watch for the *Your Computer* Soft Stars. They are awarded to games which, in our opinion, offer outstanding value.

FIRELORD

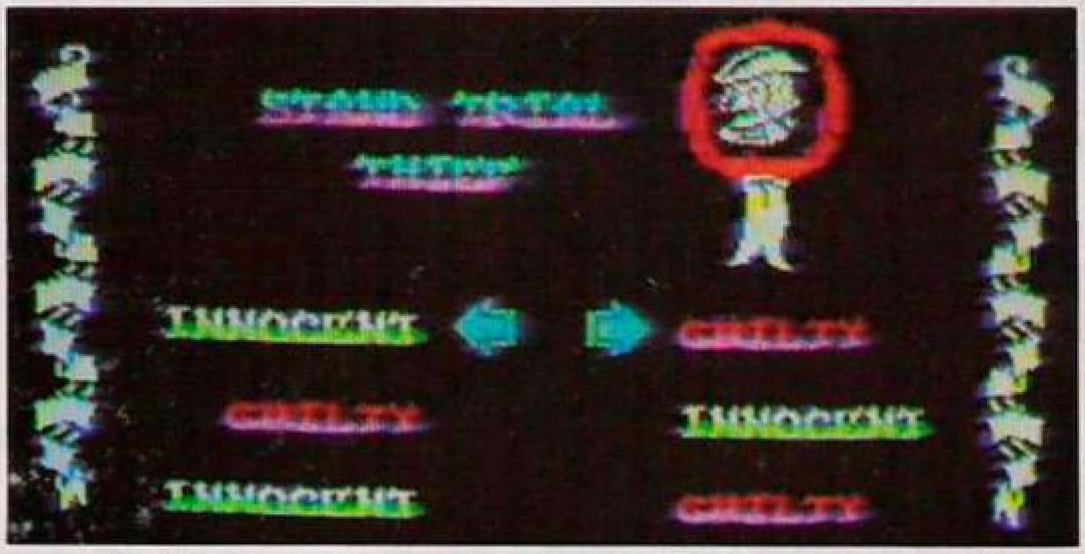
► *Various ● Hewson ● Arcade/adventure ● Francis Jago ● £8.95*

When a programmer who has recently had the honour of being named Programmer of the Year moves almost instantly to a new software house, the accusations tend to fly. Although Bubble Bus must surely miss Steve Crow, his move to Hewson must be considered

GRAPHICS ●●●●●
SOUND ●●●●
PLAYABILITY ●●●●●
VALUE FOR MONEY ●●●●●
OVERALL ●●●●●

reasonable. What Crow had to do was to make sure that his first game was as good as his last, *Starquake*, and that would be no mean feat.

With *Firelord*, he has produced an arcade adventure of such depth and quality that he must now stand alongside any of the top programmers in England. The game is set in the medieval lands of Torot, where it is your task to seek the sacred Firestone and return it ot the dragon's safekeeping. That may sound an easy task for a super-hero like Sir Galeheart but unfortunately the evil Queen will not take kindly to his actions.



To obtain the Firestone it is necessary to collect the elements of the spell of eternal youth and then trade them. At the beginning it is necessary first to obtain the enchanted crystal, as that will allow you to shoot everything in sight.

As the game unfolds it becomes apparent that its important aspect is bartering. As you enter each house, owned by peasants, witches and wizards, you can see items which they are willing to swap. If you have other items, trading can take place. The more dodgy players will also find that stealing is not too difficult, so long as you are quick.

As you gain spells, the game unfolds even more and you soon learn how to travel round the land and what is where, but with more than 500 screens, even the most dedicated fans will take a time to complete it.

Overall, Firelord is a tremendous success and it goes even further to establish both Crow and Hewson. The only question left to ask is how can the games continue to improve so dramatically?



ARENA

► *Atari ST ● Psygnosis ● Sports simulation ● Francis Jago ● £29.95*

The potential for the Atari ST as a games machine is undeniable. It has fabulous graphics and the 68000 processor is more powerful than almost any other being used in a machine costing less than £500. Even though that is true, there are very few high-quality arcade games available and they have all been programmed in the U.S.

One of the few software houses to have devoted time and money to the machine is Psygnosis and only now are rewards being reaped. Its first release, *Brattacus,* was a flop with, to quote an industry source, "more bugs than a Panamanian swamp".

Arena is another story. Anyone who has played *Track and Field* in the arcades, or any of the numerous home computer clones, will feel immediately at home with Arena, except that the game is superior to the arcade version in almost every way.

Once it has been loaded into memory, you are asked to enter the number of people who will be playing the game and

GRAPHICS
● ● ● ● ●
SOUND
● ● ●
PLAYABILITY
● ● ● ●
VALUE FOR MONEY
● ● ●
OVERALL
● ● ● ●

then to enter their respective names. The game then starts in earnest, with each competitor taking part in six events – 100 metres, long jump, high jump, pole vault, shot putt and javelin.

The game plays very well, with one



serious exception. In all its wisdom, Psygnosis decided to use flick rather than smooth scrolling and therefore as the man approaches the right-hand side of the screen, it flicks and, miraculously, the man is on the left-hand side.

Overall, Arena is a good if not brilliant game. It lacks originality in the idea and the execution is less than perfect but it is still one of the best ST games, though that says more about the computer than anything else.

FIST II

► *C64 ● Melbourne House ● Fighting ● Francis Jago ● £9.95*

The Way Of The Exploding Fist can claim to have started one of the most important genres in computer games – fighting simulations. Even though it was released in 1985, it was not until three months ago that anything bettered it, although there were countless imitations.

With *Fist II,* Melbourne House is hoping purchasers of the original game will stay loyal to the name and buy yet another fight simulation. Anyone who is



familiar with the original will feel at home immediately with the new, improved graphics, mainly because the manoevres are still remarkably similar. Thoughtfully,

GRAPHICS
● ● ● ●
SOUND
● ● ● ●
PLAYABILITY
● ● ● ●
VALUE FOR MONEY
● ● ● ●
OVERALL
● ● ● ●

Melbourne has also provided a Tournament game on the disc which is effectively the original Fist, only with Fist II graphics and scenarios.

The main difference between Fist II and most other fighting games is that the game scrolls, with the player having to walk from scenario to scenario. That does not mean, however, that the fighting scenes scroll. As with Fist, the fight can take place only over one screen.

Each time you defeat an opponent you can travel a little further into the maze and discover different back-drops and stronger opponents. One of the most amusing things about Fist II is watching enemies fly out from behind a wall a few seconds after you delivered a blind roundhouse.

If anything, the new and improved graphics seem to have shown the game play, with moves such as leg sweeps and roundhouses seeming to be much less instant than the original, although that could be a case of absence making the heart grow fonder.

One difference instantly noticeable is the quality of your opponents, with none of them being the practice mats the early opponents in Fist were. Indeed, later on, the practice gained in Tournament proves essential.

Overall, Fist II is a good game. The music is very effective, especially as it changes with each new scenario, and the energy system seems good, if a little idiosyncratic in play. One thing Fist II cannot do, however, is expect to create the impact of the original; fighting is a tiring genre and this game reflects that.

UCHI MATA

► *C64 ● Martech ● Judo simulation ● Daniel McGrath ● £8.95*

For those who do not know, *Uchi Mata* is the term used in judo for an inner thigh throw. In Uchi Mata, Martech has managed to produce a complicated simulation with many fine subtleties while still maintaining a very high level of playability.

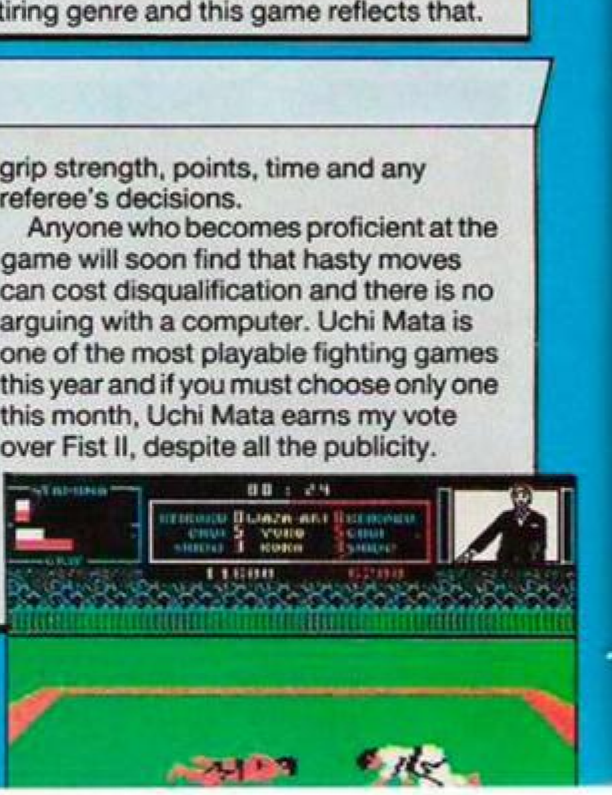
The game is set to just the proper level of difficulty to allow even a relative beginner to progress some way. What surprised me more than anything was the realism with which the throws were executed, with bodies flying left, right and centre.

Graphically the game is excellent. Uchi Mata has a display panel in the lower half of the screen which display your stamina,

GRAPHICS
● ● ● ● ●
SOUND
● ● ● ●
PLAYABILITY
● ● ● ● ●
VALUE FOR MONEY
● ● ● ●
OVERALL
● ● ● ●

grip strength, points, time and any referee's decisions.

Anyone who becomes proficient at the game will soon find that hasty moves can cost disqualification and there is no arguing with a computer. Uchi Mata is one of the most playable fighting games this year and if you must choose only one this month, Uchi Mata earns my vote over Fist II, despite all the publicity.



ANTIRIAD

► *Various ● Palace ● Arcade/adventure ● Francis Jago ● £8.99*

Rather like Christmas, games from Palace arrive once a year. At least that was the case until now. With *Antiriad*, the third release from the London-based

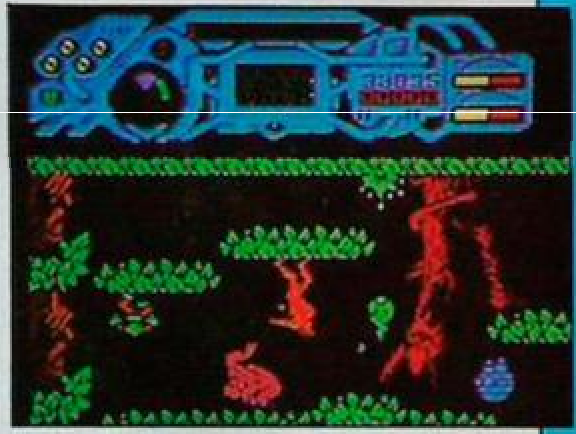


software company, it seems the tide is changing and that we should look forward to more frequent releases.

If Antiriad reaches the number one spot, Palace will have achieved the same feat a certain well-known Liverpool pop group achieved in 1985 – three number ones in succession. In full, the name of the game is *The Sacred Armour Of Antiriad* and, with graphics by Dan Malone and some lively music, the game seems set to be an essential part of any collection.

As with both previous releases, Antiriad is a true arcade adventure, set in a restricted area of play, in this case a volcano. When the game is first loaded it is the striking detail of the graphics which makes it stand out so much. The man you control, a Tarzan-type character, runs through the volcano with his hair blowing in the wind until he can find the antiriad suit which will protect him from radiation.

Even when that is located it proves less than useful until you have found the boots which allow you to fly. Once



airborne, the game has a new feeling and the size of the maze becomes apparent.

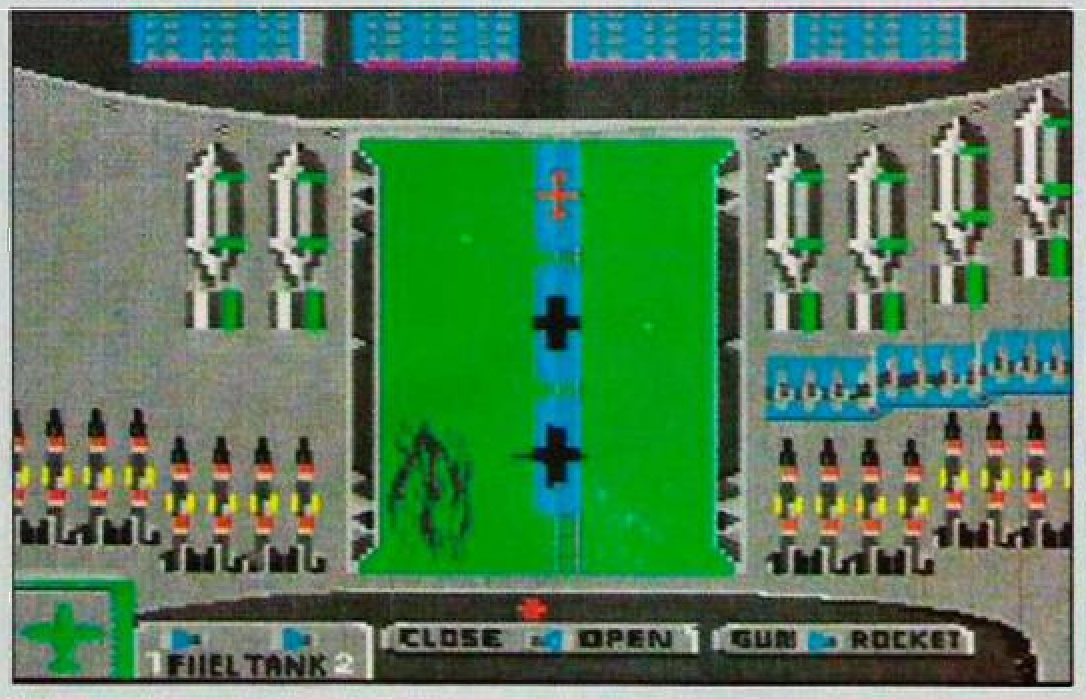
If Palace continues to release games of this quality, it will soon become a very important member of the software industry and as it seems to lack the over-exposure of certain companies, that can only be a good thing.

ACE OF ACES

► *C64 ● Accolade/U.S. Gold ● Simulation ● Francis Jago ● £9.95*

"No British aircraft will ever bomb Berlin", Luftwaffe chief Hermann Goering boasted but he was made to eat his words when a crack force of RAF Mosquitos dumped some bombs on Berlin while he was busy making a speech saying it was impossible.





Ace of Aces gives you the chance to experience the thrills and excitement of those days, but beware, the Luftwaffe is by no means a walkover. Anyone who has played previous Accolade releases for the Commodore 64 will not be surprised by the quality of the graphics, which put all other so-called action simulations in the shade.

Once loaded, the game allows you to choose on which of a variety of missions you would like to embark. They include U-boat sinking, train bombing and various shoot-everything which moves tasks. Points are awarded for successful completion and for returning alive – which is a great deal more difficult than it sounds.

To become an Ace of Aces, it is necessary to undertake all those missions simultaneously and return home safely, something which must be almost impossible. Depending on which mission you choose, you must arm your aircraft accordingly. With a choice of machine guns, missiles and bombs, you must choose wisely. Too much and your fuel will not last; too little and you will be defenceless over enemy territory.

Tactically, the game is all about being in the correct place at the proper time. Using your compass, you must reach your enemy either before he escapes or manages to shoot you down. In flight, you are informed continually of the state of your aircraft and you must be sufficiently aware to deal with anything from loss of flaps to a fire in one of your engines.

In many ways, Ace of Aces is a *Top Gun* of the 1940s and what this game does is create a very impressive atmosphere which, when in a dark room on your own, makes the years fly by.



SUPERSTAR PING PONG

► *C64 ● U.S. Gold ● Sports ● Francis Jago ● £9.95*

Although there have been conversions of table tennis for the home computer, notably the Konami version by Ocean, none has managed to create the feeling of speed normally associated with the game – until now.

With this, one of the few imports from SilverTime, U.S. Gold has shown how Konami should have approached the game and, in doing so, has added another classic sports simulation to its catalogue.

What makes the game so enjoyable is not the quality of the graphics, which incidentally are not particularly good, but the time and effort which obviously has gone into making the game-play so impressive. To endear the game to almost anyone, a variety of options allow even the first-time player a chance to get a good game from the computer.

In one-player mode, when you are competing against the computer, the game uses a three-dimensional view from one end to the other, with your bat being displayed as if it were floating in the air. As play continues, each time one game is completed the bats change sides.

GRAPHICS
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SOUND
● ● ● ●
PLAYABILITY
● ● ● ●
VALUE FOR MONEY
● ● ● ●
OVERALL
● ● ● ●

When playing a two-player game, you have a choice of either an end view or a



much more difficult side view, which requires a great deal of effort to perfect but is definitely worth it. The other options allow a choice of speeds and a very clever ploy which lets the computer re-locate the bat near the ball, so that the player has more time to worry about the shot rather than struggling to get across the table.

Any budding Desmond Dougleses will love this one.

THE GREAT ESCAPE

► *Various ● Ocean ● 3D Action ● Francis Jago ● £7.95/£8.95*



Anyone who has spent Christmas in the U.K. cannot have failed to see *The Great Escape*. With a cast list which reads like a Who's Who of the 1960s, the film was undoubtedly the greatest war/escape film of all time. Now, Ocean gives you the chance to be part of it with its latest game, named after the film and involving escape from the Nazis.

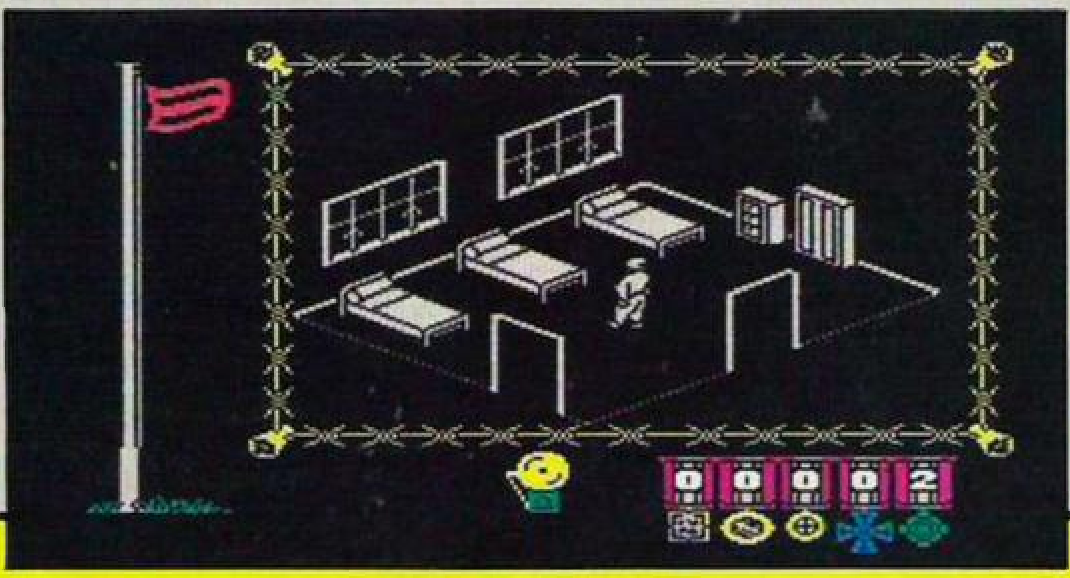
GRAPHICS
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SOUND
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PLAYABILITY
● ● ● ●
VALUE FOR MONEY
● ● ● ● ●
OVERALL
● ● ● ● ●

Life is difficult for captives imprisoned in the grounds of the old castle on the peninsula but, as well you know, it is an officer's duty to try to escape, so you must keep on. To contain you there are a series of barbed wire fences, ferocious dogs and continual searches by guards. Any attempt to change routine must be planned perfectly, or trouble is almost certain to ensue.

Once the game has started, the computer semi-controls your player. You can allow him to do as he should and appear at all the roll calls and other compulsory activities. On the other hand, you can dash into any of the outhouses and see if you can discover anything. Hidden about the area in which you can travel are tools, keys and, for the more experienced, even a few tunnels – so long as you are not Charles Bronson.

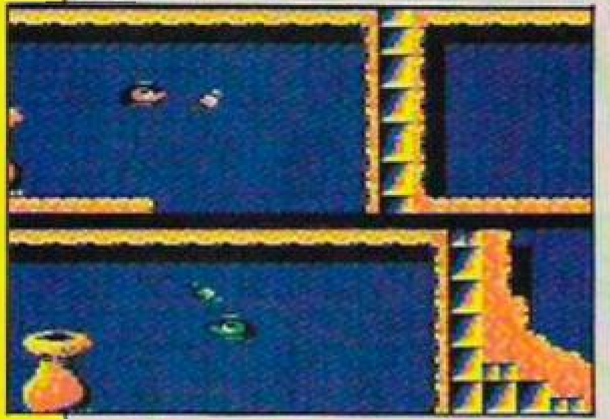
Although I have seen only the Spectrum version, even that has a good rendering of the theme tune and one which has you humming it for days. Graphically, too, the game is excellent, with very accurate three-dimensional graphics which make judging distance a great deal easier than the more usual Ultimate-esque graphics.

To complete the game you must escape from the camp but even first-time players will find the game both easy to play and frustratingly complicated. That is its strength. It has so much depth that I believe it will still be a favourite this time next year. Anyone who wants to spend a few rewarding days at Christmas will find it difficult to beat this game which is just as classic as the film.



KETTLE

► *C64/Amstrad ● Alligata ● Arcade ● Francis Jago ● £8.95*



Tony Crowther is back and this is official. Having returned to Alligata earlier in 1986, his first release, *Trap*, was a little below his best and many people were worried that, as with some other programmers, he had lost his touch.

Kettle, his latest game, silences all the doubters and is one of the most playable games for the 64 in a long time. What makes Kettle such a good game is not the basic idea, which is at best simplistic, but the options which allow the split screen aspect of the game take a completely new meaning.

The object is to travel through various levels, obtaining the vital tin opener which will allow you to exit into the next and more difficult level. To achieve that you control nothing but a mere household kettle; but it is no ordinary kettle, as it can fire bullets and it can fly.

Anyone who has played games in the arcade recently will note that multi-player games are becoming more and more popular and Kettle reflects that, allowing two players to use their respective split screens to compete, or to aid each other.

Even if you do not have a friend with whom to play Kettle it is still possible to use the two-kettle option; one acts as a defensive dummy, swinging round you continually and protecting you from the plethora of baddies. As with Trap,

GRAPHICS
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SOUND
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PLAYABILITY
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VALUE FOR MONEY
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OVERALL
●●●●

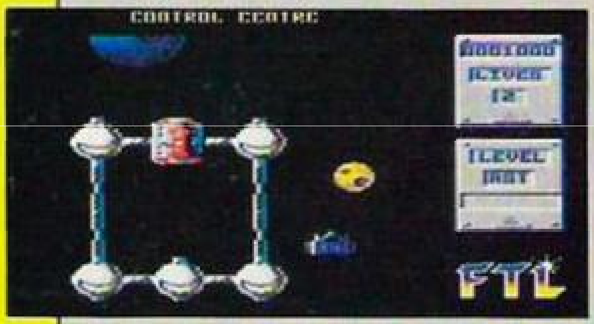
W.E.M.U.S.I.C. has combined to produce a range of sounds and music which, even if not so tuneful as some, are technically excellent.

If you are a fan of the distinctive Crowther style, as I am, Kettle will give you plenty of fun.

LIGHTFORCE

► *Amstrad/Spectrum ● FTL ● Shoot-'em-up ● John Barnes ● £8.95*

When Gargoyle Games, the company responsible for some of the technically best games on the Spectrum, and the company to which Elite turned when *Scooby Doo* became a nightmare, announces that it is starting a label on which to release games of a more arcade nature, you know that the result will not be disappointing.



Lightforce is a shoot-'em-up of almost unparalleled quality, at least on any machine except the Commodore. Using vertical scrolling, it combines the natural 'kill everything' feeling with a sense of urgency which has the player trying frequently to find that elusive extra bullet to get him out of a very sticky corner.

GRAPHICS
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SOUND
●●●
PLAYABILITY
●●●●
VALUE FOR MONEY
●●●
OVERALL
●●●●

Graphically, Lightforce makes the most of the various machine facilities. On the Spectrum it avoids colour clash well and the graphics are carefully and well-defined. On the Amstrad the game is colourful, and the shading is excellent, especially on the later, shrubbed masses.

As you play the game it becomes apparent that, as with all classic shoot-'em-ups, there is method behind the madness. To achieve success, you must be quick-witted and also be able to guess from where the next few enemies are likely to appear. Using this method it is possible to get to grips with the first two stages relatively easily.

Points are scored for shooting baddies and for blowing-up the specified amount of control centres. The latter is also rewarded with an extra life. Overall, Lightforce bodes well for FTL.

WORLD GAMES

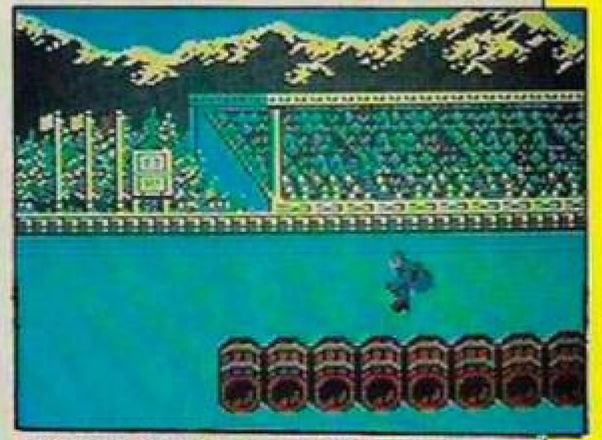
► *Various ● Epyx/U.S. Gold ● Sports simulation ● Francis Jago ● £9.95+*

Very few games can have been awaited so eagerly as *World Games*, the latest in a string of superb offerings from Epyx. Anyone who has been playing games for more than six months will know all about Epyx, and such hits as *Summer Games, Summer Games II* and *Winter Games*.

GRAPHICS
●●●●●
SOUND
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PLAYABILITY
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VALUE FOR MONEY
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OVERALL
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Unfortunately there was a problem. How could any software house continue to refine and improve an idea which seemed so close to perfection? With World Games, Epyx has answered everyone in the most impressive way by producing the goods. As with all of the Games series, the presentation is the same,m with each player entering his name and then choosing a country to represent. From then it only gets better.

The first event in which you compete is weightlifting, and as each event is associated with a specific country, the lifting takes place in the Soviet Union. Graphically, the game is remarkable. The sprites may not be the most beautifully drawn but how many games do you



know where the man depicted on the screen has a plethora of facial expressions? Miss it at your peril.

Players' Guide next month

THE APPRENTICE

OVERALL ● ● ●



► *Amstrad ● Mastertronic ● Arcade/adventure ● Francis Jago ● £1.99*

Many people have the feeling that once you have played one reasonably standard arcade adventure you have played them all, especially when the software houses become bored by writing even vaguely interesting inlays. This is not a direct criticism of this game, rather of an attitude.

To make life more difficult there are hidden doors which need to be opened using scrolls and to make life easier you can shoot the baddies.

Unspectacular, but then at £1.99 they cannot all be *Thrust*, can they?

STREET SURFER

OVERALL ● ● ● ● ●



► *Various ● Mastertronic ● Skateboard ● Francis Jago ● £1.99*

About time, too. That was my first impression when the latest Entertainment U.S.A. game arrived from Mastertronic. Skateboarding, undoubtedly the greatest participant sport on earth, had finally been rewarded with a sports simulation game dedicated to the fine art of surfing on the street.

In this game you must skate along the road, collecting cans of liquid to replenish your ever-drying palette. Immediately comparisons were made to a certain well-known car driving game but it still has a great deal of appeal.

BOMBSCARE

OVERALL ● ● ●



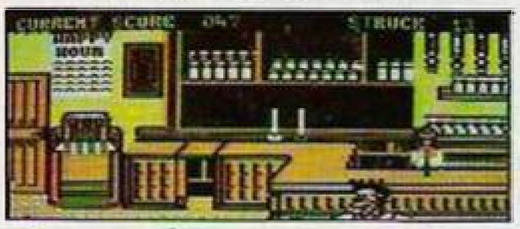
► *Spectrum ● Firebird ● Arcade/adventure ● Francis Jago ● £1.99*

There was a time when every new release from Ultimate was greeted with cheers and excellent reviews from everyone concerned. Unfortunately, that obviously gave the programmers a false sense of security and soon the games were boring and very unoriginal.

Bombscare is a game Ultimate might well have produced in the later stages of its independence, the main difference being that Ultimate would have tried to sell it for a tenner, whereas Firebird is being much more realistic in asking for £1.99.

180

OVERALL ● ● ● ●



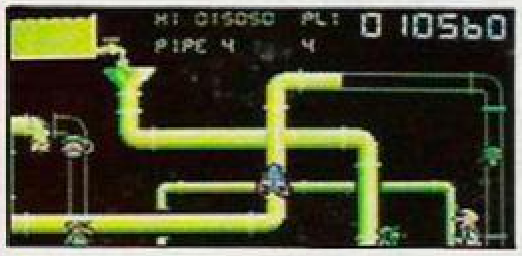
► *Various ● Mastertronic ● Sports ● Daniel McGrath ● £2.99*

With the advent of this game, Mastertronic has smashed a long-standing and highly-respected myth. You do not have to be fat, ugly and alcoholic to be successful at darts. A score of 180 puts you in the shoes of a budding Eric Bristow and with eight opponents ranging from Big Belly Bill to Limp Wrist Larry, you had better sharpen your points.

With one- or two-player options, digitised speech and excellent graphics, the game is well worthy of the MAD label.

PIPELINE II

OVERALL ● ● ● ●



► *Amstrad ● Mastertronic ● Action strategy ● Daniel McGrath ● £1.99*

Life is not easy for Foreman Fred. Sheikh Aleg is not an easy man to work for at the best of times but with the problems at the moment life is on the point of real panic. All Fred has to do is keep those barrels filling, prevent the scorpions killing him, and repair the leaks.

A little help is available in the shape of willing assistants, suitably all called Will.

Wills are dispensible and when one dies another appears to take his place. Scorpions, on the other hand, are a great deal more problematic than the odd leak – they follow you and take a great deal of killing. Oh, to be an oil baron.

PANTHER

OVERALL ● ● ● ● ●



► *C64 ● Mastertronic ● Shoot-'em-up ● Francis Jago ● £2.99*

How good a game can Mastertronic release for £2.99? The question is asked frequently in the office as the latest batch of MAD games arrives. Well, with *Panther* even Mastertronic has excelled itself. It puts the player in the normal last active man alive on earth syndrome – Mastertronic does not waste money on scenarios and that is certain – and it is your job to rescue the military personnel left behind in the evacuation.

Most easily described as a cross between *Choplifter* and *Zaxxon*, there are a few software houses which would have released the game at full price. What more can I say?

BULLSEYE

Millions enjoy this popular TV darts game, and now you can join Bully on the oche where you aim to win and throw to answer! A good arrow and you can pick your favourite topic ranging from Food to Pot Luck – a correct answer, and you're on your way! Do you want to gamble! £8.95

BLOCKBUSTERS

Sixty million people every week watch Blockbusters, Britain's most popular TV quiz game! Now, thanks to Macsen software, you can actually be a contestant, recreating the excitement of the TV studio in your own home. Our Question-master follow-up give you 500 more questions, plus the chance to insert your own – be your own Bob! £7.95

GOLD RUN

Can you beat a path through the hexagons to go for gold? The tension of this sister-game to Blockbusters is terrific, as the contestant struggles to complete his path against the clock. Adjust your own answering time to push yourself harder! £9.95

Macsen Software presents television's most popular programmes for your computer.

With our productions you can take part in your favourite programme and turn your living room into the television world of stars and sagas.

COUNTDOWN

Countdown has come! The days of the simple crossword are numbered. Who in your family can find the longest word in a group of nine letters? Who is the quickest at crunching a three-figure number! Buy Countdown for hours of nail-biting enjoyment. £8.95

TREASURE HUNT

We give you a helicopter, a guide and your clues – the rest is up to you, as you search throughout England, Wales and Scotland, past castles, cathedrals and cottages to sniff out the hidden treasure. Thanks to our enclosed book, you won't need Kenneth Kendall to help you. Happy hunting! £9.95

EASTENDERS

Enter Albert Square and experience life among its inhabitants – taste their joys and woes, share their happiness and pain. See if you can survive the trials of this close community. Look out for Macsen EastEnders Software in your shops soon.

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All games available from leading computer departments and computer stores.



Gadgets for

Christmas is rough on micro junkies. They are a solitary breed, by and large. To them Christmas is the time when hordes of dodo relatives stand round their terminals asking inane questions about how it all works and preventing them hacking royal mailboxes or determining what really happens on the final screen of *Marble Madness.*

You have to endure all that pathetic nonsense because they have bought you presents. Never mind the fact that they always manage to choose the most unreliable modem on the block, the one joystick which does not work on your interface, or the least likely version of *Gauntlet* in the shops. It is the bribe which counts.

This is a brief guide to what is available this Christmas. Desperate parents reading the article furtively may find a few clues which save their face while aunts and uncles are losing theirs. I have also included a selection of items for people you really hate, the kind of boring monstrosities who insist on recounting the full tale of how they beat *Elite* while you are trying to watch *Star Wars,* or shout loudly the saga of the legal troubles of *Domark* when you are settling down to a compilation of the *Best of Spitting Image.*

Send robot bananas

Let us start with the most honest present on the market. The Nintendo games machine has no official price tag yet but it will probably be in the region of £100. Of course, you cannot program it, you cannot turn it into a Prestel terminal and it will not send a robot arm bananas. All it does is play real computer games of the kind which cost mountains of silver in the arcades.

If Alan Sugar really knew his market, he would have ditched his entire range of cardboard boxes and produced one of these. High-street stores will love it. Ever since Sinclair first suggested computers were not toys they have been trying desperately to prove otherwise.

If you must buy a real computer, go for real street credibility this Christmas. Forget the Armpits clone; you have missed the bus if you have not ordered one now. The Atari ST is the horse to back; the Amiga seems a little too intellectual for the new post-Clive brutalism and the £70 QLs which some shops are selling have an indelible reek of the bargain bins. Forget the old warhorses, the 8-bit bundles – Spectrum plus remaindered soft-



yuppies

Christmas is meant to be a time for giving but it is what you receive which really counts. Chris Bourne looks at the light-hearted side of popular presents for computer buffs.

ware plus poor printer plus balsa wood joystick and so on. They will be around only until the next *Sunday Times* 'which hi-tech company shall we send bankrupt this time?' exposé.

Besides, Jack Tramiel of Atari outbrutalities Sugar any day of the week and he does not crack pathetic jokes about disc drives and rubber bands.

It is generally a good idea to give people software to go with their new computers and if they already have computers, it is generally a good idea to give them some software.

Staying with the ST for a moment, the two essentials are *The Pawn* and *Star Glider*. The Pawn is the best adventure game written by a British software house; it is very funny and it talks real English. It also has wonderful pictures which make you feel happy about the money you paid for the ST.

Star Glider is a genuine honest-to-goodness arcade game – very rare on 16-bit machines – and makes your children feel good about the money you spent on the ST.

That said, if you have Commodores or Spectrums you are still well fixed for another Xmas. Now that the censors say the CRL *Dracula* must not be sold to under-15s, it is required playing for anyone in the 11-17 age group. You will never be forgiven if you do not buy your children this one. Besides, it is a highly literate piece of writing, mainly due to the bright wheeze of using an ornate Victorian style for the descriptions.

On the arcade front, the Gargoyle *Light Force* is the shoot-'em-up with real cult feeling for the Spectrum, since it might give users the edge in the perennial battle of the graphics between themselves and Commodore-owning bully boys.

If you have a rich granny who despises computers, help is at hand with the Domark *Trivial Pursuit*. If she does not reinstate you in her will after playing this one, nothing can save you.

At the completely trivial end of the market is the Thingi, a strip of stiff white plastic with a twist in it. A piece of Velcro at one end attaches to the top of your monitor and a bulldog clip at the other end holds the papers from which you are typing at the keyboard.

If you are doing nothing of the kind because *Star Glider* is so absolutely wonderful it still makes a great filler. It is just the thing to stiffen that christmas stocking so that the jumbo bar of Toblerone does not break when you lift the bulging footwear on Christmas morning.

Psion Organiser

The ultimate executive toy is still the Psion Organiser, now in its second reincarnation. It looks good, really fits in your pocket, only costs £99 and has a wonderful finance package which lets you do your expenses in real style.

Although it is alleged to be many times more powerful than an IBM PC, you will probably be too busy showing off the never-ending diary to notice but it certainly out-Filofaxes all those wretched trendies in advertising. Watch your boss gape in astonishment as you pretend to reel off all the latest sales figures from its revolutionary Datapaks.

Real men, however, do not buy pocket computers – they buy newspapers instead. If you know anybody with a fundamental urge to emulate Robert Maxwell, Maxwell has the gift for you – the Mirrosoft *Fleet Street Editor*, which allows you to ascertain just how much drinking time journalists could save if they laid out all their pages on computers.

Desk-top publishing is really the province of the Apple Mac, though, which is why Apple is so scared of the threatened IBM invasion of the market. Hence the long-standing Apple campaign to persuade journalists to buy the machine at half-price, with a half-price laser printer thrown in. The really rich should be able to cash in on this with a little imagination – to wit, finding a friendly journalist in whose name you can buy the system.

Of course, it still needs paper, which is not the case where I spend most of my energies these days – Micronet. Micronet subscriptions are ideal gifts for people you dislike but who always manage to be at the same parties, drink in the same pubs and generally make themselves the bane of your leisure hours. Hook them on viewdata and you will hear from them for weeks on end. For £70 for a year's subscription there is a free modem as well, so why suffer alone?

Bulletin boards are breeding like rabbits at the moment, thanks to a little package called Micron B which allows BBC computer owners to set up and run their own. It is the poor man's version of desktop publishing but it also wins real computer kudos, launching you directly into the middle of the hackers' universe, where you can spend the rest of your days wallowing in an unreal world of IDs, passwords, packet-switching and baud rates, with the added spice of rampant paranoia.

It is the season for charity, so I suppose I had better offer some consolation to PCW owners who are beginning to realise why the machine was so inexpensive, even though it includes a printer. Answer – the printer goes from 0-60 in less than 10 seconds; 0 to 60 degrees Centigrade, that is.

Don't worry. Buy *Leather Goddesses of Phobos* instead and enjoy a classic piece of Infocom flummery, courtesy of Activision. It is nothing like so rude – or sexist – as the title and publicity suggest, though if anyone can tell me what to do with the female gorilla besides making love to it I would like to know. This is a class adventure with never a picture in it, so PCW owners need not feel inferior.

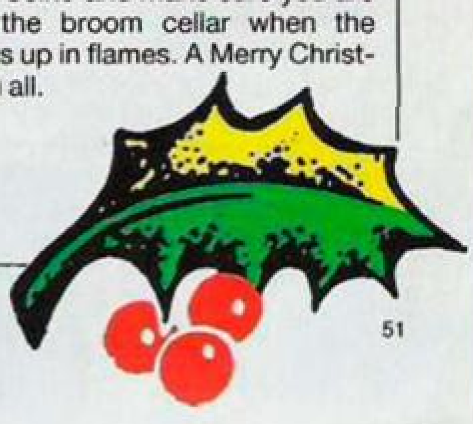
On the music scene, nothing was so astounding as the SpecDrum from Cheetah, which sounds just as good as a £400 drum machine. In some ways it is even better than a real drum-kit, because when the cops turn up to nick you for disturbing the neighbourhood at three in the morning you can put the black box in your pocket and nobody is any wiser.

Simulating children

Most micros are gathering music peripherals round them at some speed, though, and it is worth looking into; at least, it might stimulate children into doing something moderately social if not mildly creative for a change.

Finally, something which is not a computer but ranks with the Seiko wristwatch with printer terminal as one of the most ludicrous things anybody could wish to strap on their wrists. It is an LCD wristwatch cigarette lighter and it costs about £12. The idea is that you cannot lose it, because it is strapped to you.

Did I say it had nothing to do with computing? That was not correct. Because if you, like me, sometimes think your nearest and dearest have all gone silicon bonkers, this is for them. Just tell them it's a Mk II Seiko and make sure you are hiding in the broom cellar when the Amiga goes up in flames. A Merry Christmas to you all.



Beating the best

Difficult they may be, but these tips should help defeat the Hewson hits.

For many Commodore 64 owners, Christmas will be a time to receive and get to grips with some of the hits of 1986. Shoot-'em-up fans will be pleased to hear that *Your Computer,* in association with Hewson, is presenting a guide to two of the best blasts of 1986, *Iridis Alpha* by Jeff Minter and *Alleykat* by Andrew Braybrook. These insights will not make you beat every high score but they should make understanding the games a great deal easier, and that is at least half the battle – more with Iridis.



Early in the game, two licker ships attack your Gilby on the upper planet.

Iridis Alpha

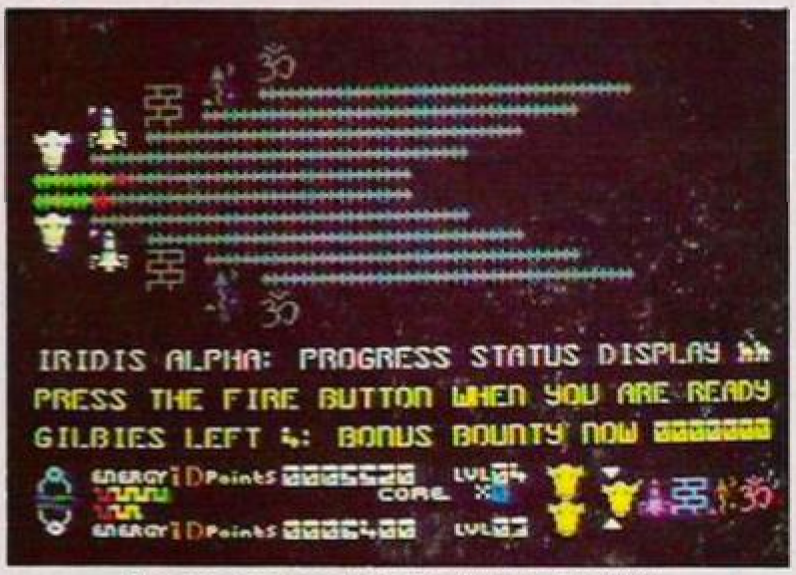
There are two realistic approaches to this classic Minter blast. First you can jump in and play until you get the gist of what is happening or, second, you could spend a time understanding the game, and then jump in. Understandably, most people want just to play the game, not think about it, but in practice a few minutes spent learning should make your game last a great deal longer.

Keep transfering

As most people will know, the idea is to guide Gilby, the hero of this little romp, round the planet until you can transfer sufficient energy into the planet core to enter the bonus zone. In play, the first thing to understand is that it is possible to have too much, as well as too little energy, so it is always best to try to keep depositing and gaining energy in a regular fashion.

Once the main object is clear the next most important piece of information is how to kill the incredibly annoying licker ships. In fact, it is similar in many ways to mutants in *Defender* – simply fly left, occasionally spinning round to fire, and then spin left again. In a matter of 10 minutes' practice that should become relatively natural.

The next most important thing to learn is how to transfer to the lower planet – a piece of cake. Shoot any of the aliens which produce a spinning ring and then fly into the ring. It is essential to keep transferring to avoid one or other decaying. On some levels, there are no spinning rings but a Warp Gate will do the trick just as well.



The progress screen illustrates the state of play at any time.

Progress screen

Another point to keep your eye on is the Entropy guage. If it ever gets very dark you must remember to do one thing – panic. Seriously, though, that indicates that it is very necessary to transfer.

Once the first three levels have been completed, the progress screen will tell you how well or, more likely, badly you have performed.

Iridis Alpha is a classic shoot-'em-up but it requires thought as well as quick reactions. To quote the author, "Give 'em hell – but think about it."

Licker ships monitor rolling progress in the bonus phase.



Alleykat





After programming two undeniable classics with *Paradroid* and *Uridium,* Andrew Braybrook decided to change his ideas and to move from the now famous bas-relief mettallix graphics which worked so well for his first two games. For this one major change, many people criticised the game without even bothering to play it. If they had played Alleykat, they would have found a game with a great deal of subtlety which further establishes Braybrook in the top echelons of the programming fraternity.

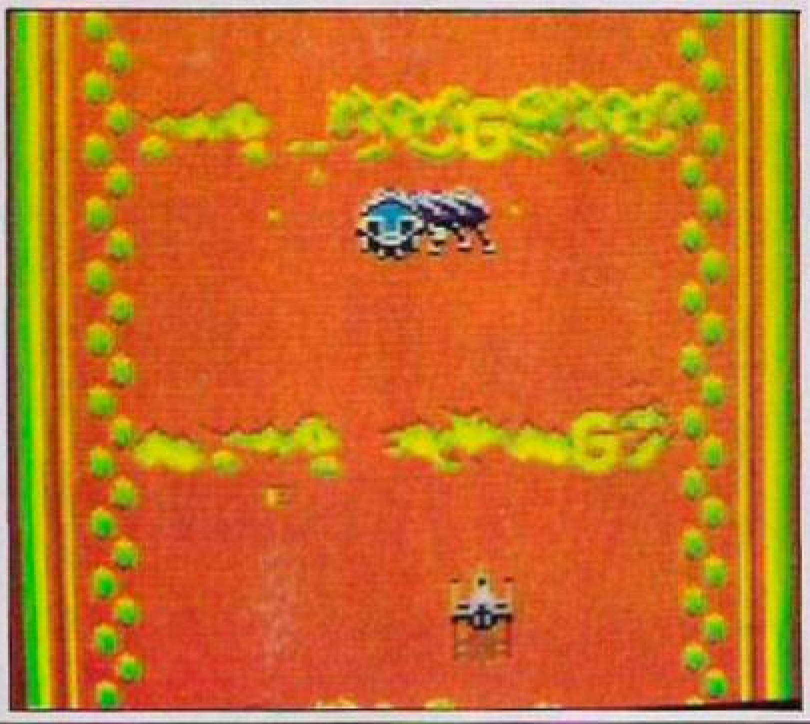
Prize money

Using a background of an interstellar sports competition, Alleykat is a race against time. As the months pass, every race the competitor wins allows him to pay more money to enter the next race, and therefore stand a chance of winning the greatly-increased prize money.

Each of the tracks on which you race is based on different landscapes, some using abstract forms with others based on forestation. Unfortunately for the contenders, the authorities decided to establish some fearsome opponents to make the races more and more difficult. Even in the short, demolition races, the fearsome Katerkiller can prove an almost insurmountible problem.



As a player, you start in the fifth season of Alleykat racing and your aim is to get your name on the all-important gold Alleykat trophy. To beat Alleykat and therefore to stand any chance of winning the trophy it is necessary to learn both the types of race and the difficulty of landscape on which you are about to fly. *Your Computer* makes this a great deal easier with the following table, which describes the different types of landscape.



Landscape types

Arboris. Petrified and living forestation. Many tiny bushes can cause minor abrasions. Easy to destroy.

Trellis. Tubular frames and metal-pronged plates. Weak.

Grafico. Graphical solids, large but fragile.

Hardwall. Very sturdy double-thickness wall, which is virtually indestructible with gunfire and very painful to collide with.

Shatter-rock. Unstable rock formations, destroyed easily.

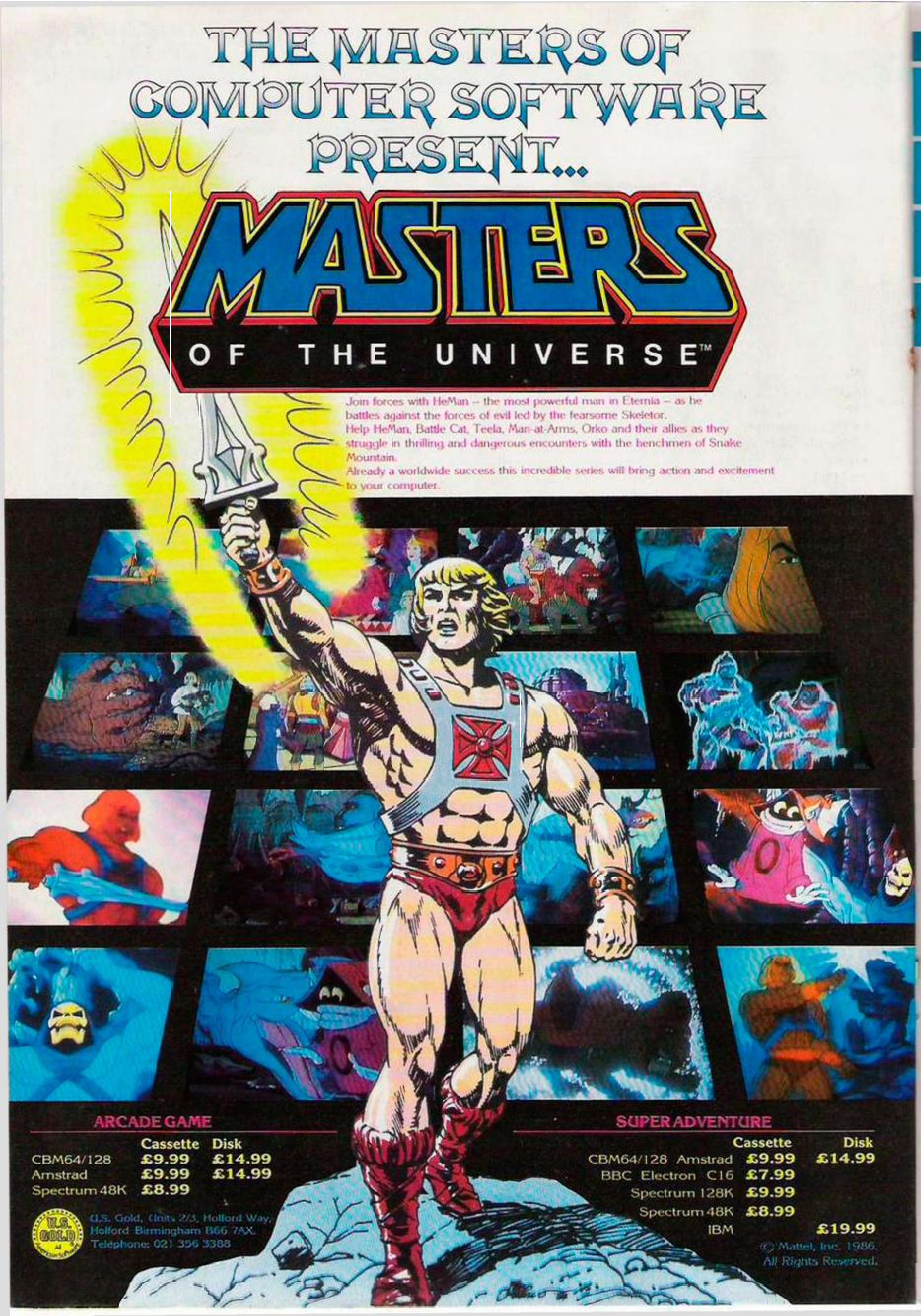
Technorama. Tough technical structures, many unsupported anti-gravity pieces; try to avoid collision.

Aquadrome. Mainly pools formed in cracks in the race-way. Few tall frames, all of which are destroyed easily.

Skulnia. As its name suggests, fearsome skulls which are very tough. Avoid at all costs.

Using this table, together with the instructions, it should be possible to get a long way into the game. One last tip – do not always go for the most rewarding race, as some with only slightly less money on offer are frequently a great deal easier.

• ***Your Computer* wishes to thank Hewson for all its help with this article.**


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QUESTIONS

1. What was Andrew Braybrook's first game for Hewson?
2. Name three Jeff Minter games?
3. Which Hewson programmer wrote *Starquake?*

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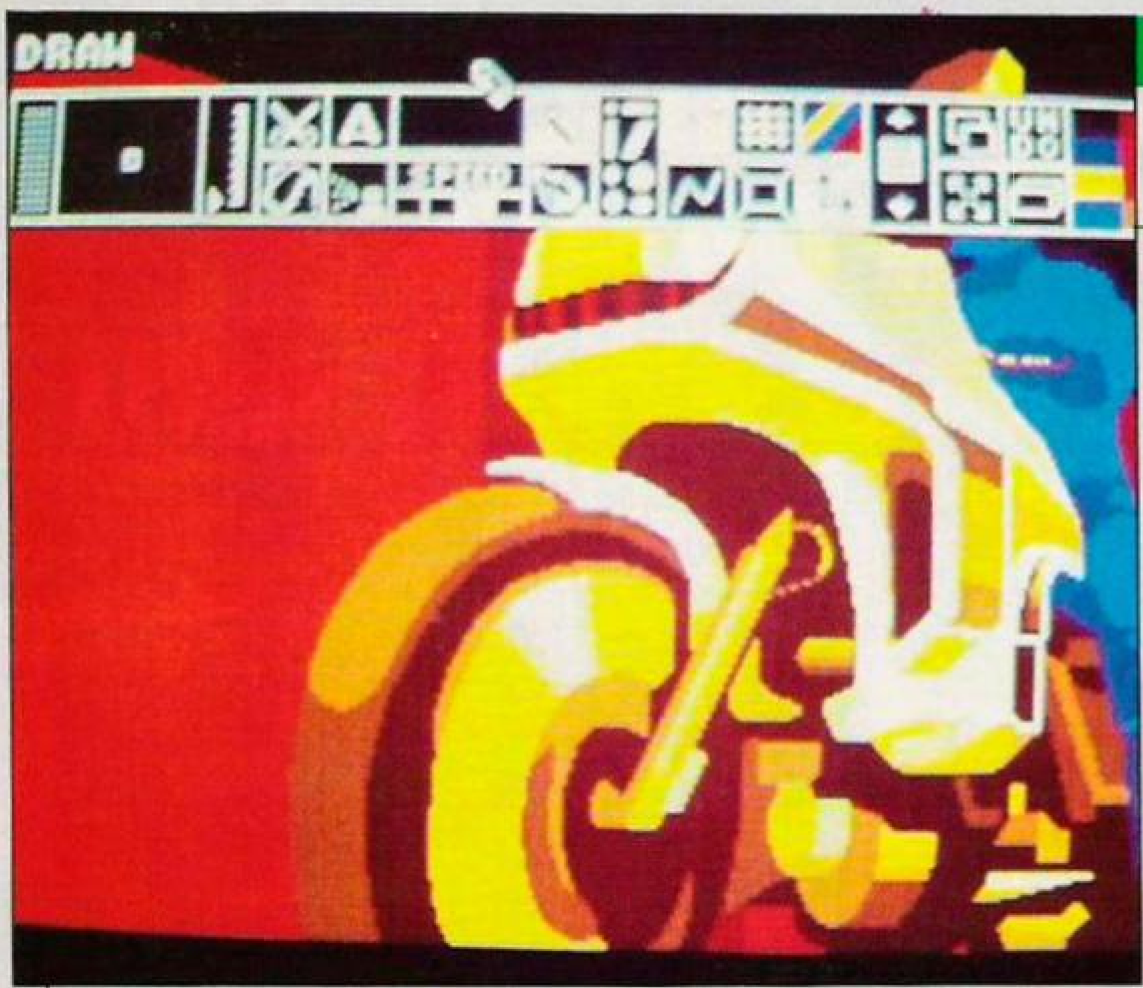
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Example of cycle colours.

Directing towards success

With this package the ST comes of age. Stephen Applebaum explains.

Atari ST owners have waited a long time for the Andromeda *Art Director* and *Film Director* to emerge from Mirrorsoft. Often what happens when something takes so long to surface as they have done is that levels of expectation rise to a point that, however good the product, it can never match pre-conceived notions. If you are one of those waiting for the packages, I can tell you that they are well worth the wait.

Art Director – £49.95 – is a painting package *par excellence* which can do everything *Deluxe Paint* does on the Amiga, plus a great deal more, while *Film Director* – £59.95 – is a complex animation utility which provides the tools to draw and animate characters in much the same way as professional animators. Together, Art Director and Film Director make a formidable combination.

When I used them, both packages were waiting to be copy-protected and their manuals completed. I cannot pass much comment on the manuals, therefore, as they were both in an incipient form but I hope that the hand-written comments on the typescript of the Art Director manual will be noted by its author, as he seems to have omitted a great deal of very basic information. Such omissions make some facilities difficult to reach. I would think, though, that all would have been dealt with by the time the program reaches retailers.

The first thing I noticed about Art Director is its somewhat idiosyncratic menu layout. Rather than having its basic tools packed away in a vertical menu down one side of the screen, it has a lateral toolbox which can be slid up and down over the work area and toggled on/off with the f10 function key.

One would think that this unorthodox format would mean the toolbox getting in the way but it does not. When an area obscured by the strip is to be worked on, you either shift it to a higher or lower position on the display. The idea works very well and when you are accustomed to it, proves to be far more flexible than, say, the fixed menu in *Macpaint*, because it means never having to move the cursor far from the area being worked on but just to select a new brush or pen nib.

Clicking the right-hand mouse button produces four sub-menus along the top of the screen. They are Desk, File, Easel and Modify Brush. Four more can be accessed via a command in the pull-down menu found under Desk. What you have then are Make Brush, Tool, Line and Font; they are known, collectively, as Art Director advanced features. Together with the toolbox, the sub-menus contain some of the most powerful design functions seen on any home micro.

Returning to the toolbox, it contains the basic items common to virtually all painting packages. Without going into too much detail, there is a pen for drawing freehand, a paintbrush, an airbrush, a general fill function and a small collection of paintbrushes of pre-set sizes. Some things not so mundane are two meters to control the rate at which paint is applied and to enlarge or diminish the area covered by the spray from an airbrush.

At the far left of the toolbox there is a square window which displays a slightly-enlarged view of the area immediately surrounding the cursor, be it a pen, brush or whatever. The purpose of the window is to give a pixel-by-pixel representation of the part of the picture being worked on.

An interesting feature of the window is that it treats the toolbox as an invisible entity, displaying even those parts hidden from sight.

The window is, effectively, a magnifying glass of variable strength, which is to say it can be used to enlarge a defined portion of a picture, so that it occupies the entire screen. Again, the magnified image is at pixel level, though the size of the square equating to a pixel differs dramatically as the magnification changes. At the highest level, 16x normal size, the pixels become big, big bits, while the area exposed decreases; the opposite is true on both accounts at lower magnifications, the lowest being 3x normal size. It should be apparent that the ability to zoom-in on a painting makes not only drawing fine detail easy but also increases the possibilities for using different shades and hues to express form.

To make a picture come to life, artists often use different shades of the same colour to give the effect of shadows, skin tone, contours and, in fact, anything which enhances the physical topography of a subject.

It would be ridiculous to use the same shade of green throughout a landscape, as the picture would appear flat and lifeless. For a picture to appear alive, it must have form and texture and to produce those, an artist requires a comprehensive repertoire of colours.

A facility for mixing colours in a way similar to combining oils on a palette exists in Art Director. To give you some idea of how this works, I will first explain a little about the Atari ST colour-handling. Like virtually all micros, it has several screen modes which operate at different resolutions. Apart from the displays, the thing which sets the modes apart is the amount of memory each needs to function.

A high-resolution display requires a great deal more memory than a low-resolution one, which means something must be forsaken for it to operate.



Art Director.

Usually what is needed is the number of colours which can be present on screen simultaneously, hence Art Director utilises the ST low-resolution mode – 320 x 200 pixels – in which a maximum 16 colours can co-exist at any time.

Returning to the Art Director Palette Control Box, it is a window containing a number of sophisticated functions for mixing colours into subtly different shades and for creating simple animation by the quick transposition of colours.

Colours are made and changed by altering the intensity levels of their red, green and blue components. They are the three basic colours which constitute a television picture. What you are doing when forming a colour is altering the discharge rates of the red, green and blue electron guns of the monitor, so changing the brightness of each component. Thus colour depends on the intensities of the components relative to each other.

If all that sounds complicated, it is not in practice. Art Director allows the intensity levels of each component to be changed by highlighting a square labelled between 0 – low intensity – and 7 – high intensity. If all three colours were set at 7, the resulting colour would be white, while 0 would produce black.

The 16 low-resolution mode colours are all represented in the palette window as single, individually-coloured strips, labelled from 0 to 15. Each strip can be selected using the mouse and then its colour set in the way described.

Eight palettes are available per canvas; they are found in the PCB labelled A to H. Only one of the eight can be used at a time, however, but some interesting effects can be achieved by jumping from one to another using the Cycle Colours function found in the Easel menu.

Cycle colours

Even before drawing anything, an idea of what Cycle Colours does can be gained by applying it to one of the four example paintings supplied on the Art Director program disc. A full screen vignette from Boticelli's Venus makes the best subject; the result is surprising, to say the least, as Cycle Colours makes her look like something straight out of the mind of Timothy Leary – a kind of Boticelli on acid. The colour handling is impressive, though even that, I think, palls beside its extensive set of brush-making functions.

In addition to the small collection of pre-set brushes in the toolbox, new ones can be made from pieces cut from paintings. They can be of any size, from a single pixel to the entire work area, if you are perverse enough to want a brush so big. The simplest brush which can be excised from a canvas is a rectangular one. Unlike the majority of brush-making commands, the one for making it is found in the toolbox; all the others are spread throughout two Art Director pull-down menus.

Found in the Make Brush menu, part of the advanced features repertoire, is a cornucopia of special brush-making functions which puts most other art packages to shame. Apart from being commands to create brushes, those found in the Make Brush menu also produce special effects which can, if used properly, enhance parts of a picture with very little effort on the part of the artist.

In all 18 kinds of brush can be made, four of which are outlines of common geometrical figures such as a circle, an oval, a rectangle and a square; four more commands produce their filled equivalents. The 10 remaining functions perform tasks far less ordinary than drawing shapes.

Rescale picture

The option at the top of the list of contents in the Make Brush menu is Rescale. Just as its name implies, this function allows any part of a painting to be enlarged, reduced, turned upside down or reflected. Whatever Rescale is used to do, the portion of canvas affected always becomes the brush. That does not mean it disappears from the picture but rather that it can be used to paint with in the normal way.

Stretch, the second selection on the list, works in much the same way as Rescale, except that it allows the height and width of a figure to be changed independently of each other. I never could manage to make either Rescale or Stretch to produce the desired result. Whether that was due to the manual being incomplete or my lack of understanding I do not know. Whatever the reason, I am sure they both work.

One of the weirdest functions of Art Director is Distort. In the manual, its operation is likened to printing an image on to a rubber sheet and then bending it any way you please. In a way, that is exactly what the finished result looks like. Unfortunately, I think the program designers have been too ambitious there, as the result of distorting a figure, far from being what you would expect, is a mess. I managed to make some interesting brushes out of parts of the face of poor old Venus but apart from those, everything else was a disaster.

Of all the brush-making functions in Art Director, my favourite is Bulge. It gives a portion of a picture a convex or concave aspect. The effect of the former is rather like inflating a balloon with a picture on it. As it is inflated, the picture becomes rounder, larger and ultimately distorted. The same appearance is obtained when Bulge is applied to a canvas.

Another function, Perspect, allows brushes to be put into true perspective. If you are not sure of its relevance, think of holding a book at eye level and rotating it slowly in different directions; as it moves, the book appears to alter in size because its position relative to your eyes is changing constantly. Making the same appear true on paper is known as perspective.

Medieval artists often ignored perspective and if you look at their paintings you will see that people are often the same size as the walls of a castle or that there is no distinction made between objects in the foreground and those in the background. Perspect, therefore, changes the look of a brush to how you would see it if it were a three-dimensional object in a three-dimensional world.





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128K Spectrum to the limit

Audrey and Owen Bishop show that there is more to 128K than meets the eye.

To Spectrum owners accustomed to working with only 48K memory – or even only 16K – the thought of 128K must arouse excitement but is it not so simple as that. Although there is 128K of memory inside the 128K Spectrum and the new Spectrum+2, the essential memory map remains as it was in the 48K models.

The article by Dick Sargent in *Your Computer*, May, 1986, described how you can switch in the extra RAM and use it in various ways. His techniques involved the use of simple machine code routines. Now we present some methods of using the extra RAM from ordinary Basic programs.

The Basic of the 128 provides a set of commands for treating the extra RAM as if it were a disc drive. You can SAVE!, LOAD!, ERASE!, VERIFY! or MERGE! programs or data files just as if you have a disc drive attached to your machine. The computer takes care of all the details, such as exactly where to store the programs or data file, where to find them when they are required again.

The advantage of the RAM disc, as it is called, is that transfer between the RAM disc and the main RAM is extremely fast – much faster than when using an ordinary magnetic disc drive.

War game programs are long and they require masses of data. The same remarks apply to adventure games and many other types of programs.

If a program requires the use of tables of data which are referred to by the computer at different stages in the program, it is a simple matter to store the tables in RAM disc as data files and bring them down into the main RAM whenever they are required.

That is the principle of the overlay. An area of memory is set aside specially for receiving blocks of data – data files – brought down from the RAM disc. If the blocks are of unequal size, the area must be big enough to hold the largest. Suppose the largest file is 6,000 bytes long. Allowing for the fact that memory from address 65368 (UDG) is reserved for user-defined graphics, the first byte of the data file should be at 59368.



At the beginning of the program you need the statement CLEAR 59367 to set aside that overlay area of memory. To bring down a file into this area, the command is LOAD!"filename" CODE 59368. Even a very large file is transferred in an instant, without apparent interruption of the program. When a different set of data is required, it can be brought down to overlay part of, or the whole of, the existing data.

It is best to be systematic and always load the data to the start of the overlay area. If you are doing a good deal of overlaying, it is worth setting up a variable, say z, with the start address of the overlay area – e.g., LET z=59368. Then the loading command is LOAD!"filename"CODE z, which reduces program length.

If you have two sets of data which will both fit into the overlay area at the same time, and particularly if you are reading data continually from one block and storing it in the other, you can have both sets of data in the block at the same time, in different parts of the area. You might be doing that repeatedly, in a loop – figure one – but if there is not sufficient room for both sets of data, transfer between RAM and RAM disc is so fast that you can LOAD! and SAVE! data files alternately in a loop without appreciable loss of speed – figure two.

Note that in figure two the loop includes the SAVE! command so that data stored in RAM disc is updated each time round the loop. As a general rule, whenever you alter data in the overlay area, the original file in RAM disc must first be erased, then the updated file is re-created in RAM disc by using SAVE!

Although there is plenty of memory available in the RAM disc, files cannot be loaded from tape or Microdrive directly into this area. Everything has to pass through the main RAM on its way to RAM disc. The same applies if you need to save data from the RAM disc to tape or Microdrive. So the main RAM acts as a bottleneck in the flow of data.

The solution to the problem is to feed the data through main RAM a block at a time. You require a loader program like that in figure three. This sets aside a large area of main RAM for data storage, then reads a block of data from tape or cartridge into this area. The data is then split into sections which are SAVE!d individually in the RAM disc. Other blocks can be loaded subsequently and disposed of in the same way.

After that, RAMTOP is moved up to allow a longer program to be accommodated, yet reserving sufficient space at the top of memory for the overlay area. Finally, the loader program loads the main program, which previously has been saved to run automatically by using the LINE statement. If you are using tape, the loader, the data blocks – binary files – and the main program must be recorded in that order on the tape. With Microdrives or disc drives there is no problem so long as all are on the same cartridge or disc.

Figure 1. Using overlays in a loop, with two resident data tables. Data is transferred from table 2 to table 1, possibly with some re-calculation in transfer. Data table 1 consists of 1,000 bytes, so data 2 begins at 60368. The various data addresses are calculated by expressions not detailed here.

```
300 LOAD!"data1" CODE 59368:LOAD!"data2" CODE 60368
310 FOR j=1 TO 20
320 LET value = PEEK (<address in data2>)
330 LET value = newvalue:REM an unspecified calculation
340 POKE <address in data1>,newvalue
350 NEXT j
360 ERASE!"data1":SAVE!"data1" CODE 59368,1000
```

It is surprising how easily a program can grow to such a length that it no longer fits into the main RAM. Yet certain sections of the program are probably used only once or very occasionally. There may, for example, be a section at the beginning of the program for selecting options, dimensioning arrays and assigning values to variables. That section may never be returned to again, yet it occupies valuable space for the whole of run-time.

A program normally consists of a main program which calls a number of subroutines. In a war game the main program consists of a few calls to the introductory subroutines – choice of options – followed by a loop which calls the subroutines for each phase of the game turn. The loop repeats for each turn of the game. The main program of a war game is usually very short, perhaps fewer than 20 lines.

Each subroutine handles a self-contained phase of the game. Such a subroutine is almost a mini-program and so may be lengthy. The subroutines may call on other subroutines for such purposes as getting input for the keyboard, handling displays, or creating sound effects. These secondary subroutines, to which we will refer as sub-subroutines, are each used by several of the subroutines and they are usually relatively short.

It is the subroutines which make up the bulk of such a program yet, at any given time, only one of them is being used. The idea of dynamic programming is to store each subroutine in RAM disc and bring it down into main RAM only when it is required. The working program thus consists of the main program – short; a number of short sub-subroutines; and the subroutine which is currently in use.

Dynamic programming relies on the MERGE! command. All the subroutines it uses are stored in RAM disc. They all begin with the same line number, say 9000, and their lines are all numbered in even tens. Their first line number is greater than any line number in the main program and sub-subroutines. They do not need to be the same length. To bring a subroutine into action, the main program has statements of the form:

MERGE!"newsub":GOSUB 9000

The main program consists of statements of this type. Subroutines merge virtually instantaneously, with no apparent delay in the running of the program and subroutines.

When a subroutine is merged, its lines replace those of the same line number belonging to the subroutine which was merged previously. If the previous subroutine was longer than the new one, the final lines of the previous subroutine will still be there at the end of the program. They will not be used, of course, since there is a RETURN at the end of the new subroutine. After the program has been running for a time, its length is that of the main program, plus all the sub-subroutines plus the longest subroutine.

Figure 2. Using overlays in a loop with only one table resident at any time. Both may be long tables and are loaded to the beginning of the overlay.

```
300 FOR j=1 TO 20
310 LOAD!"data2" CODE 59368: LET value = PEEK (<address
    in data2>)
320 LET value=newvalue: REM unspecified calculation
330 LOAD!"data1" CODE 59368: POKE <address in data1>,
    newvalue
340 ERASE!"data1":SAVE!"data1" CODE 59368,5000
350 NEXT j
```

Before a subroutine is merged, it is transferred from RAM disc to the area of memory following the resident program. That area must be big enough to accommodate the longest subroutine – figure four. Thus it is the length of the longest subroutine which restricts the amount of memory available for the main program and subroutines.



To overcome the restriction, some long subroutines may be held in RAM disc in sections, each starting at line 9000, and merged and called one at a time. Other subroutines may be unavoidably long, especially when they consist mainly of a long program loop.

They can also be held in RAM disc as two or more sections but their line numbers are consecutive blocks – 9000-9090, 9100-9190, and so on. The sections are each merged one after the other, building the complete subroutine before it is called. The economy of memory here is that by merging short sections, we do not need to allow so much space for the merging process.

Daisy-chaining is the method we use for putting the subroutines into RAM disc. Each subroutine is saved on tape or cartridge as a separate program. Before saving it, we type-in an extra program line at the start of each subroutine. For the subroutine called "thisone", and using tape, the line would be:

8995 SAVE!"thisone":LOAD "nextone"

Using cartridges, this would be:

8995 SAVE!"thisone":LOAD* "m";1;"nextone"

Each subroutine is then saved under its own name:

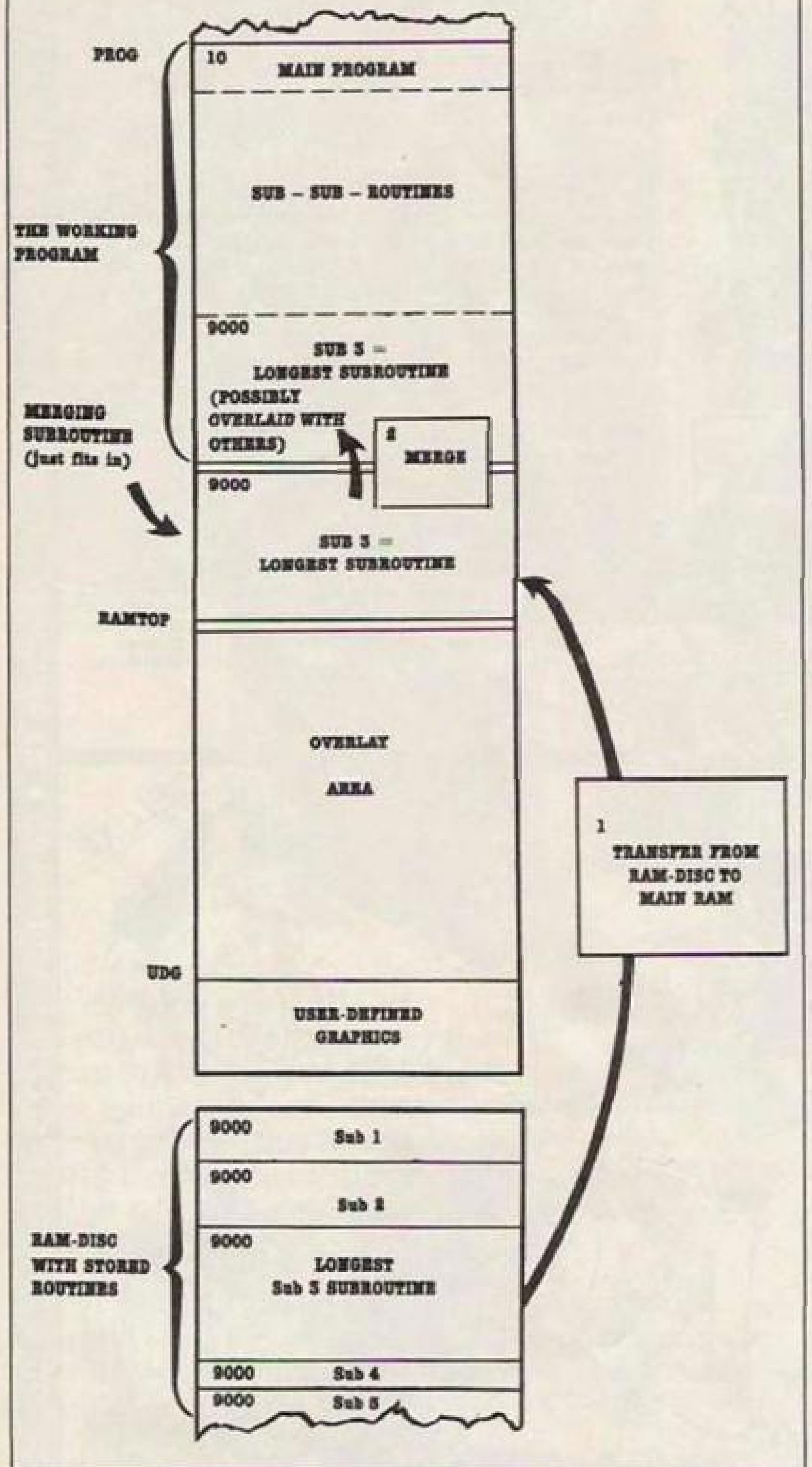
SAVE"thisone" LINE 8995

We build a series of subroutines, each of which runs when loaded, saves itself in RAM disc, and then loads the next in the daisychain – figure five. The first of the subroutines is loaded by the final statement in the loader pro-

Figure 3. Outline of typical loader program. All large data blocks have been saved to tape previously so as to load to address 40000.

```
10 CLEAR 39999
20 LOAD "firstdata" CODE
30 SAVE!"table1" CODE 40000,1000: SAVE!"table2" CODE
41000,500: SAVE!"table3" CODE 41500,3000: REM and so on..
40 LOAD "seconddata" CODE
50 SAVE!"table12" CODE 40000,3000: SAVE!"table13" CODE
43000,100: SAVE!"table14" CODE 43100,4500: REM and so on.
60 REM possibly more LOADing and SAVE!ing
70 CLEAR 59367
80 LOAD "program"
```

Figure 4. Stages in merging a subroutine. The memory map of the critical case – merging the longest subroutine. The diagram ignores stored variables, stacks and so on.



gram. The last subroutine in the daisychain loads the main program, which has also been saved to run automatically.

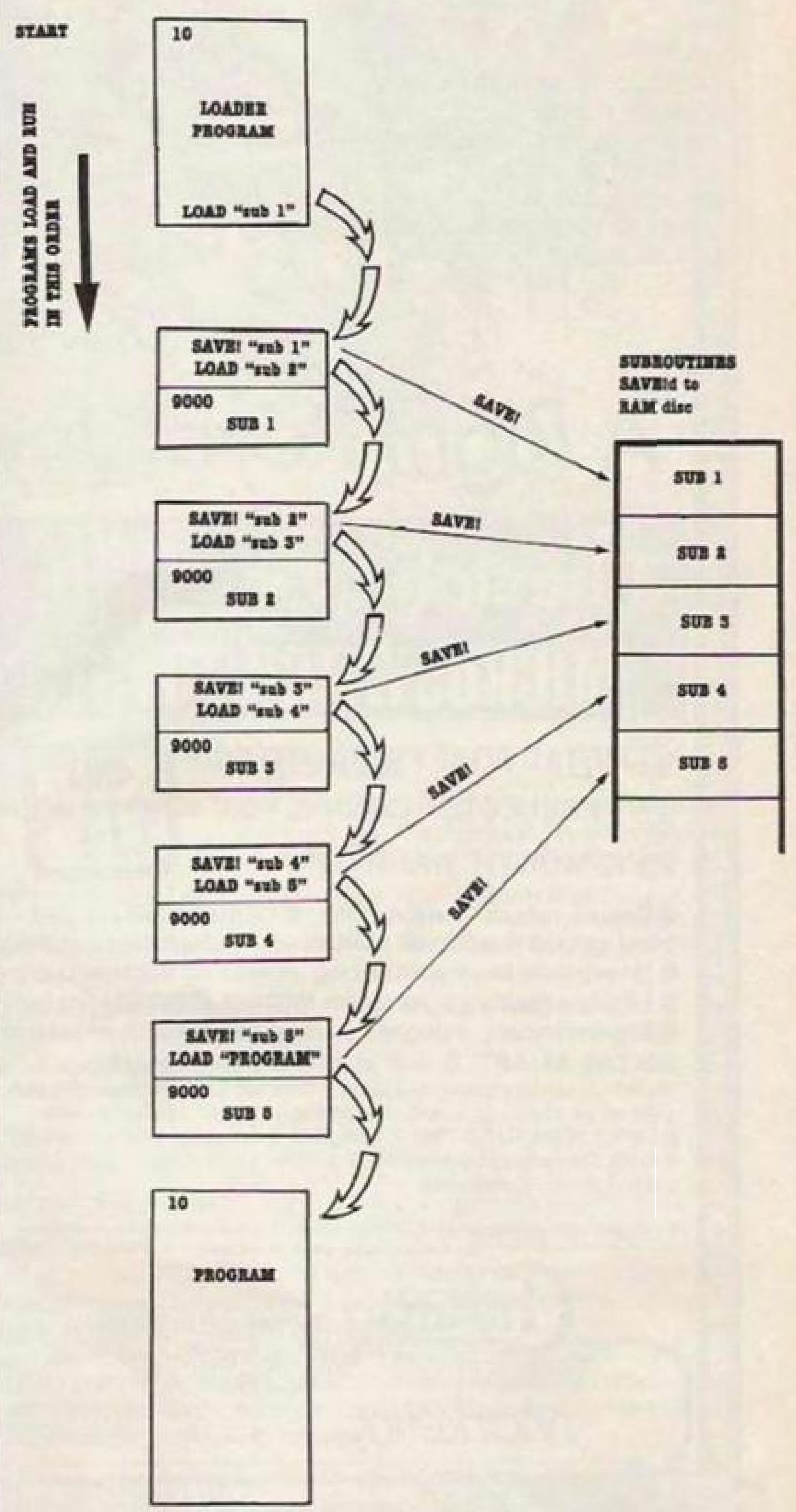
If you are using tape, the programs must be saved in the order, loader, data files – if any – subroutines – in daisychain order – main program. With cartridges or disc drive it is much simpler to put them all on the same cartridge or disc.

One of the features of merging is that it also merges any variables associated with the merged program. If they have the same names as existing variables, the values they had with the merged program replace their existing values. That can lead to difficulty, particularly with variables set at the beginning of a program which are supposed to retain their value for the whole of run-time.

When a subroutine is merged its variables are merged, too, and they may possibly have been assigned different values in previous running of the program. Variable values may change mysteriously, in a way which suggests that there are ghosts at work in the computer. The solution is to type CLEAR before you save a subroutine on to tape or cartridge. That rids the subroutine of all its variables and so exorcises the ghosts.

• *Audrey and Owen Bishop are the authors of two new war games,* Gallipoli *and* Zulu, *published for Spectrum and Amstrad computers by Cases Computer Simulations Ltd. They are also authors of* Wargaming on the Amstrad *published this autumn by Argus Books Ltd.*

Figure 5. Loading daisy-chained subroutines.



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SIGN OF THE TIMES

Computers in action this month goes on the buses to see how the problems of traffic jams, road works and breakdowns are being tackled by London Buses with the use of a new computer system. Armed only with a travel card and a bus map, John Barnes reports.

Waiting for a bus is an experience common to all, as is the feeling of frustration caused by waiting for an indefinite period at a bus stop for a bus already late – and shows no sign of arriving in the immediate future.

That is a daily problem for London Buses Ltd, not because of inefficiency in the administration or the scheduling, but because of the problem timetabling a bus route in a large urban area presents. Traffic has become so unpredictable in London that the same road can have completely different traffic flow characteristics on two consecutive days with no apparent explanation.

Such problems result in buses running late and in rapid succession, which is not good for the operator or the passengers. London Buses is well aware of the problems and at present is conducting an experiment on a busy central London route in an attempt to rectify difficulties which have been the scourge of commuters and operators alike.

Busco

The £1.8 million pilot scheme is called The Bus Communications and Control System, BUSCO. It also incorporates a passenger information network – Passenger Information at Bus Stops, or PIBS – designed to increase passenger confidence in the accuracy of timetables – and to prevent customers being lost – by displaying accurate times of arrival.

The system diagram – figure one – illustrates how BUSCO works. Each bus is equipped with a certain amount of electronic equipment – a microcomputer which monitors and drives the functions of the other on-bus units, a radio which serves as the transmitter and receiver between the bus and the control centre; the loop detecting device which receives the signal from the road loop and hodometer which logs the distance travelled since the last loop; the running number reader which identifies the different buses; a driver display and keyboard unit which allows each driver to receive and transmit coded messages to the control centre and a loudspeaker; and a microphone unit which enables the driver to speak to the controller.

In addition, on bus equipment a series of road loops are placed at strategic points along the route,m such as turning points and route dividing points. The route also has a number of aerials and transmitters to maintain contact between the buses and the control centres.

There are two control centres, a local one at Peckham garage where the route 36 is based and the central computer at the London Buses control centre in Baker Street.

More competition

The heart of the system is the central computer which maintains constant contact with the buses and also interrogates them, through the radio link. Information is compiled about the movements of each bus so that the computer knows the identity of the bus with which it is communicating and its destination and position along the route. Those details are transmitted to the local control centre, where the route controller can assess how close to schedule each bus is running.

That is accomplished easily by analysing the information sent to the computer terminal at the Peckham centre. The terminal displays the entire route indicating where the different road loops are



situated. The information is displayed in diagramatic form, indicating each individual loop and a list of the bus running numbers which have just passed but not yet reached the next road loop. It is also capable of indicating which buses are not running but are stationary at stands.

If the controller can see any necessary adjustments to the route, such as the traffic flow causing several buses to bunch, the alterations can be decided on and the drivers informed of the changes the controller requires. Those instructions are sent to the bus and are displayed on the small screen in the driver's cab. If there is a query with the revisions, the driver can contact the controller through the radio link.

Similarly if the controller needs to question a bus driver, the radio proves an efficient way of resolving problems along the route.

The second half of the system involves the display of up-to-date route information at bus stops. PIBS makes use of the same data as the BUSCO central computer but uses it in a different way. PIBS is the latest addition to the two-year-old BUSCO system and represents a significant advance in passenger services.

Each of the ten stops are equipped with a computer-generated display which indicates to passengers at stops the estimated arrival time of the next two buses on the route. The information is transmitted to stops by route control system and is displayed as a series of messages which are updated every minute.

All London routes?

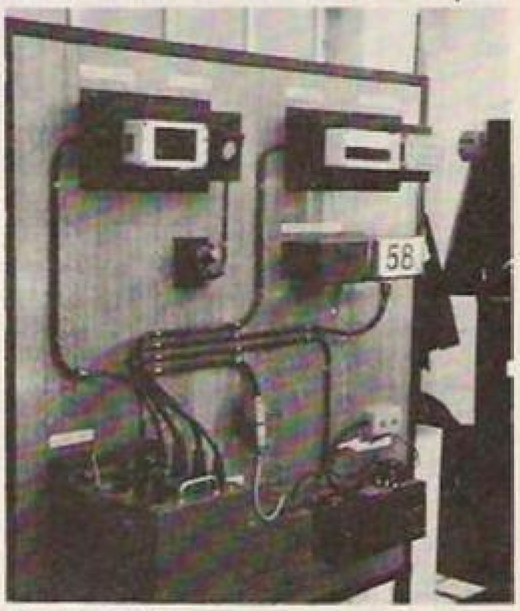
The advantages to passengers such information provides is invaluable in terms of the time saving it offers. If you were told that your bus would be arriving at the stop in 10 minutes, any last-minute shopping could be done or, if the weather was particularly unpleasant, you could go to a cafe.

That type of service to customers also helps London Buses Ltd to compete more successfully with direct competitors such as the Underground or taxis, which often capitalise on bad traffic conditions or the lateness of buses by attracting potential passengers who have grown tired of waiting.

The BUSCO system has been developed entirely by London Transport engineers with the experience gained from the two earlier bus control systems, the Bus Electronic Scanning Indicator and the Computer Automated Radio Location Aid.

Trials of the whole PIBS system started in early August and were due to be completed by the end of November, when the results will be analysed and conclusions drawn about the effectiveness of the system.

The project on the 36 route has been designed to test the system under real operating conditions and the results will be used to determine whether BUSCO and PIBS could be used successfully on other busy central London routes. At present the likelihood of it is promising. The monitoring of the buses is proving to be extremely accurate and route efficiency is much improved. Surveys conducted by London Buses Ltd have shown that passengers are impressed by the increased efficiency but, when asked if they think it is attributable to anything in particular, none has heard of BUSCO or PIBS, which illustrates how successful it is.



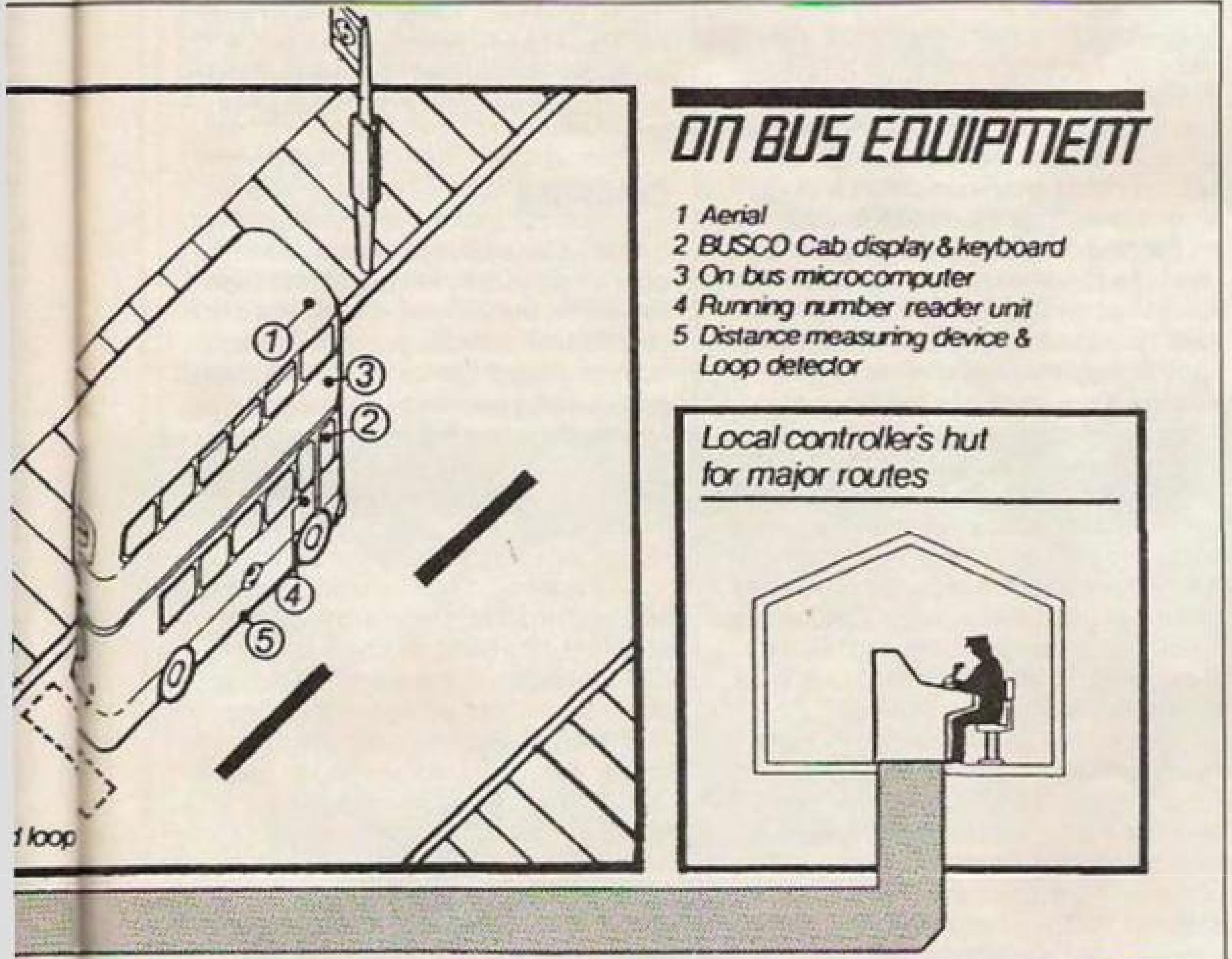
Demonstration.

Impressive

When we decided to test the system, the result was impressive. Waiting at one of the 36 bus stops showed just how accurate the information displayed there was. Of the 20 buses we monitored from the stop, the biggest discrepancy between arrival time and the time displayed on the information board was no more than one minute either side.

That performance, when compared to a non-BUSCO/PIBS route, allowed no room for comparison, as the timetable displayed on the bus stop bore only a vague resemblance to the arrival time of buses.

With such impressive results, let us hope the results of the London Buses Ltd survey prove as successful and that the scheme will be extended to other central London routes – and perhaps eventually to all.





The new Hitachi 2500S CDROM Optical D/D with combined audio and data storage.

ROM WITH A VIEW

Soon the compact disc player will affect computers, as well as hi-fi. Bruce Everiss reports.

It was always thought likely that computers would reduce the need for paper. The argument was that data would be held on magnetic media, discs and tapes instead. Data could be transmitted between computers by telephone and be brought to the screen whenever needed. The reverse has happened, with computer printers having an insatiable appetite for paper. Each year more trees are felled to meet the demand, with no end in sight – until now.

Recent developments have produced a means of storing data which is one hundred times cheaper than paper. It is the humble compact disc player to the rescue of the world's forests and the real excitement is the way they will work with personal computers.

The technology which does it is called CDROM – Compact Disc Read-Only Memory. All it takes is a simple, mass-produced compact disc player. Connect it to your personal computer and insert the database disc of your choice and you have unprecedented power over knowledge.

Mankind has been incrementing his total knowledge exponentially since the dawn of civilisation. The time is long past when all that knowledge could be handled easily. It has led to greater and greater specialisation in society, from education through to job function. The age of the renaissance man is a forgotten dream.

Now for the first time man will be able quickly, cheaply and easily to handle the world's knowledge. The implications and consequences are too great as to be even vaguely comprehensible. The fact is that civilisation will shortly undergo a revolution comparable to the invention of printing.

High speed

The compact disc drives used are identical to the music ones, which now cost less than £200 complete with case and power supply, ready to plug into your hi-fi system. A naked drive costs less than £100 to manufacture.

The music CD mechanism has a high-speed digital-to-analogue converter chip which makes music from a stream of ones and noughts. It was intended initially that the computer version would replace it with an error-detection and correction chip. Now it seems likely that both chips will be included, so that a drive becomes multi-purpose.

A single disc is 120mm. (4.72in.) in diameter, weighs 0.7 of an ounce and has a single track some three miles long. The disc contains 550MB of data. Put in perspective that is about 10 *Encyclopaedia Britannicas* or 1,200 standard 5¼in. floppy discs – all on one disc.

Indexing

A difficulty with such enormous quantities of data is error-detection and correction. To that end a very sophisticated error-correction encoder is used to encrypt the data before it is put on the disc. The data is then de-encrypted by the special chip when it is read. That gives a hard bit error rate expected to be as good as 10E-25. Put another way it equals one undetected wrong bit in a stack of bare discs one billion miles high.

Another consideration is the indexing of huge amounts of data. Take the *A to Z of London* and fewer than half the pages are street plans – in other words, data; more than half is the indexing needed to make that data usable. With CDROM, the more usable the data needs to be, the more space is taken by indexing. It is an area where artificial intelligence techniques will be very useful. Already much is being done in this area.

For speed, CDROM is somewhere between floppy and hard discs. Typical average radial access times are 500ms or more – hard disc 50ms – with a latency of about 100ms – hard disc 8 ms. Data transfer rates are 1.3Mbit/sec. for CDROM compared to 250Kbit/sec. for floppies and 5Mbit/sec. for hard discs. The track density of a CDROM is enormous at 16,000 tracks per inch, compared to fewer than 100 on floppies or the several hundred per inch on a hard disc.

CDROM will be able to handle still and moving images in both black-and-white and colour. Sound can be two separate tracks or stereo, either integrated with the previously-mentioned images or separate. Computer data can be either digital program files or digital information files.

Publishing

To handle all this requires a powerful operating system. Microsoft and Digital Research, the industry giants, have not yet released suitable systems, though both are thought to have them developed and awaiting launch. In the meantime, Microsoft has added extensions to MS-DOS which allows it to access CDROM. TMS Research Inc. has available Laserdos, which works alongside either PC-DOS or MS-DOS.

All this system software and hardware will require data on which to work. To that end there has been much buying of CDROM rights to the world's databases, to the extent that virtually everything obvious is now spoken for. In other words, publishers are waiting to give us the total of human knowledge on compact disc.

Foremost among them is Robert Maxwell. His Pergamon Press has been in electronic publishing for years and he takes a keen interest in all areas of

information technology. Pergamon Infoline is the on-line database division and it has set up Compact Solution which offers a CDROM publishing service to third parties. It is under the control of Jim McConochie, the man who set up Mirrorsoft.

The CDROM revolution will be all the more significant because all the data will be attached to a computer. That means that data will not just be accessed and read, like a book. It means that data processing can be done on the data by the computer. Programs will access and make use of enormous quantities of human knowledge. The possibilities are endless.

If you had a huge quantity of data and wanted to publish your own disc there would be two costs. First, encrypting and mastering which would be from about £2,000 – £4,000 depending on the form of the data. Second, disc production would cost from £4-£8 per unit depending on the volume being produced.

Endless possibilities

So far we have looked at CDROM as a pure knowledge engine. Though the potential is enormous, there is even more. The multi-media capabilities, when applied to entertainment, promise endless possibilities. CDROM will form the heart of the integrated electronic home entertainment environment of the future. When applied to education in the form of interactive learning, the potential is revolutionary. The combination of enormous quantities of information connected to computers capable of presenting it in an easily-assimilated form is very powerful indeed. CDROM could replace the teaching profession.

The proposed multi-media CDROM standard was invented by Philips and is known as CDI – compact disc interactive. The man in charge of this in Europe is Byron Turner, who used to help run Activision.



CDR 2500 built-in CDROM.

Another form of computer laser disc is the WORM – Write Once Read Many – although it is not a mass-produced consumer durable like CDROM. WORM promises to be much more expensive for the foreseeable future but it has its applications in certain areas of commerce and science.

The main proponents of CDROM are Philips, Sony and Hitachi. All three already produce expensive systems for computer use. Current systems are IBM PC-compatible internal or external mounting or SCSI – Small Computer Standard Interface.

The Atari ST has always had a built-in DMA – Direct Memory Access – controller which is there principally to connect a CDROM. Jack Tramiel has been unable to buy naked drives in the quantity and at the price necessary to offer it as a low-cost option, which obviously remains his ultimate intention. Amstrad is well-positioned to enter the arena as it is already big in hi-fi, CD and personal computers.

More information on CDROM is available in a massive book, *The New Papyrus*. It contains papers written by world experts on all aspects of the forthcoming revolution. Published by Microsoft, it is considered essential reading for anyone involved.

The significance of the area is highlighted when an important senior software industry boss like Hugh Reece Parnall leaves a comfortable job with Activision to set up as a CDROM consultant.

Already working

Finally, let us look at a possible application which highlights the new capabilities. Take a microcomputer, floppy disc, CDROM and inertial reference platform – total cost a few hundred pounds. Connect them and fit them to your car. Put in the compact disc containing information on roadworks and bottlenecks.

Tell it where you want to go – it already knows where you are. A few seconds later the optimum route appears. If you dislike it and ask for an alternative, it takes a few more seconds. Then you start, the computer telling you when to turn left or right and so on. It even warns you if you go off course.

If that sounds like science fiction, you will be interested to know that this system is already working in prototype form.

CDR 1500S standalone.



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TELESOFTWARE

Telesoftware is the name for computer programs which are broadcast on Teletext. Thus they may be loaded OFF AIR into the appropriate micro computer instead of being loaded from say TAPE or DISC. Both Channel 4 and BBC are broadcasting Telesoftware, however there are the following limitations:-
(a). Spectrum Adaptor:- All Teletext Channels but Channel 4 Telesoftware only.
(b). BBC Adaptor:- All Teletext Channels but BBC Telesoftware only.
(c). Amstrad Adaptor:- All Teletext Channels, Channel 4 Telesoftware programs and BBC Telesoftware data files including the Education Newsletter.
★Channel 4 is currently expanding its Telesoftware programs particularly CP/M based material.
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Commodore conversion?

Recently I bought an Amstrad 6128 which I intend to use for programming. I already own a Commodore 64 plus MPS 801 matrix printer and I would like to know if it is possible to connect the MPS 801 to the Amstrad for program listings. The MPS 801 is a six-pin serial but has, or so I am told, a built-in processor designed for Commodore computers only.

Kevin Price,
Scarborough.

Editor's reply: While this kind of conversion is theoretically possible, the time, cost and effort involved do not make it a worthwhile option. You would be better buying an Amstrad-compatible printer or, failing that, contacting Commodore and Amstrad to find exactly how you would make the conversion.



Legal question

I keep a file of addresses of computer companies on record cards. I am thinking of computerising it but under the Data Protection Act, 1986, would I need a licence? Would I also need a licence to cover a telephone book of my friends' numbers? All things are for private use only.

Simon Collins,
Brawaton,
North Devon.

Editor's reply: The Data Protection Act requires all data users – anyone storing personal information about others – to register as a data user. All home computer owners, unless they play only games, are data users. The problem is whether or not the information held on the machines is personal.

If you are a home user and store names and addresses on your machine you are exempt from the Act but there are certain restrictions relating to who sees the data. The best course for anyone who feels uncertain about the nature of the data stored on their machines is to contact the Data Protection Registrar, Springfield House, Water Lane, Wilmslow, Cheshire SK9 5AX.

Daisy or dot?

I am the owner of a BBC computer. I recently acquired a copy of *Wordwise* and am now eagerly word processing. My problem is which printer to buy. I will be using my word processor mostly for letter-writing. Would it be better to buy a dot matrix or daisywheel printer? I am looking at a maximum price of about £300. Can you recommend the best buy?

D. Jones,
London N16.

Editor's reply: For your immediate requirements a daisywheel printer would be the obvious choice but it is not so versatile as a dot matrix printer and is more expensive.

The variety of printers available makes it impossible to recommend any particular one, but any dot matrix printer with Epson compatibility would be a good buy – you should expect to pay between £200 and £250. If you want a daisywheel printer, the Brother HR10 is a good buy.

Which Amstrad?

I help in a local voluntary organisation which produces a monthly news booklet. We have finally obtained enough money to buy a computer to assist in the production of the publication but do not know which computer to buy.

The choice has been narrowed to the two Amstrad machines – the PC 1512 and the PCW 8256, but we do not know which is more suitable for our needs. Perhaps you could help resolve this dilemma.

Mrs. Davies,
Wendover Dean,
Bucks.

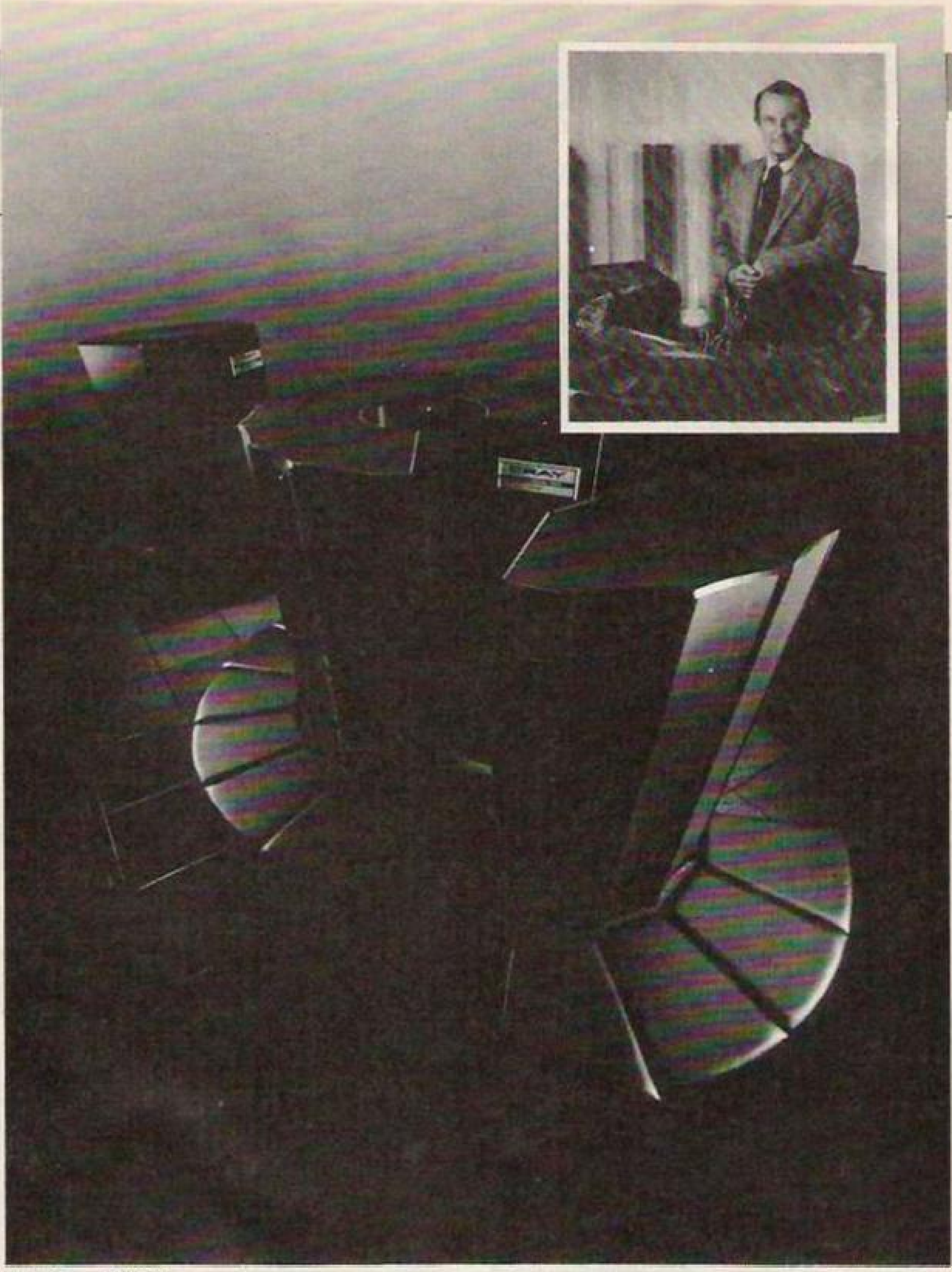
Editor's reply: If you compare the cost of using the two machines for word processing that should help make up your mind. The PCW is supplied with a dot matrix printer and the necessary software – Locoscript – for £399 excluding VAT.

The Amstrad PC, however, has no word processing software included in the £399 package and does not have a printer. Those extras would increase the cost of setting yourself up to produce the magazine. With the prospect of desk-top publishing soon to be released for the PCW, your £399 would be better spent on the 8256.

In effect, that means you have no need for more expenditure, although a publishing system of some kind would save a great deal of time.

MAN LOGIC By NEIL BRADLEY





The Cray XMP/4

Heaven sent

Probably the most powerful computer in the world, the Cray XMP is one of the machines behind the button. Geof Wheelwright looks at this ultimate dream machine.

I am not really ready to tell you about this month's dream machine yet. I am still dreaming about the Cray range of supercomputers, arguably the most powerful commercial mainframe computers in the world. As Cray has not been kind enough to lend me one of its supercomputers, you will have to let me keep dreaming, as that it about the only way I shall even get near one of the machines.

The problem is not only that I do not have the money – even Apple Computer could afford only one machine – or that I do not have a spare few hundred square feet of office space.

Even the fact that moving one of them outside its native U.S. requires a special clearance permit from the U.S. Department of Commerce could not stop the all-powerful *Your Computer* Dream Machine review team. No, the real problem is that I would not have the slightest idea what to do with it.

Space Shuttle

It is like an automotive journalist trying to think how to go about doing a road test of the space shuttle. We in the dream machine business have many talents but reviewing computers which measure their capacity in megaflops is not one of them.

"MegaWhats?," I hear you saying. A megaflop is a measurement of how many million floating point operations a second a given supercomputer can carry-out. To give you an idea of how much raw computing power that represents, the average laboratory mainframe computer at a university puts out about half a megaflop.

The likes of the Cray XMP and the company's other supercomputers are in the 50-megaflops-plus league, and fast pushing for two gigaflops by the turn of the century. For those who may not remember their mathematics, a gigaflop is 1,000 megaflops.

As there is no possibility of me using such a machine, it is probably worth telling you the kind of uses to which such equipment is being put – and that does not include playing the ultimate version of *Elite*. Cray computers have two major constituencies at the moment, the computer graphics industry and the aerospace/military community.

The former uses Cray machines to produce much of the stunning computer graphics special effects you see in films and television. In conjunction with a dedicated graphics system such as the IMI-500, Cray machines played a part in realising the instrument panels of both the *Knight Rider* car and the *Airwolf* helicopter, as well as many of the striking space scenes in the film *The Last Starfighter*.

in an article last year in *Computer Pictures*, a U.S.-based computer graphics journal, Los Angeles-based Digital Productions explained that it used a Cray XMP in conjunction with three IMI-500 graphic systems and a Digital Equipment VAX machine.

To plan the motion in a given animated sequence, Digital

uses an IMI-500 and the VAX to build the elements which will make up the motion. The VAX will then describe that as a series of numeric matrices – I told you this was high-level stuff but it becomes less complicated in a minute – to the Cray XMP, which does the number-crunching necessary to get quick and accurate wire-frame representations of the scene.

Cray Equipment

The most powerful use of the Cray equipment, however, is one you or I are scarcely likely ever to see. It is supercomputers like the Cray which are expected to drive the Strategic Defense Initiative – or Star Wars, as it is more commonly known – and provide the kind of speed and power which will be needed to calculate which nuclear missiles are going where and at which exact point a laser beam needs to intercept them.

Star Wars is envisioned as some kind of global clay pigeon shoot, except that all the clay pigeons will be let loose at once, will be moving over a vast distance and must be hit by more than one gun at a time if the world is to remain safe.

Designing the computers to do such work – never mind the software, which is a nightmare all its own – will require attention not only to speed and power but also to reliability. That factor means that some critical components of the next generation of supercomputers may not use the humble silicon chip at all but instead the gallium arsenide processor.

Galium arsenide

Major computer manufacturers like Cray, Sperry and IBM are all looking at the gallium arsenide chip because it offers the important advantage of being largely radiation-resistant. So in a nuclear exchange, the side launching its first strike would have to do so in the certain knowledge that even a close-proximity strike on the hardened missile silo containing the supercomputer would not necessarily knock out control of the nuclear equipment held by the target country.

On a slightly less sombre note, we should point out that supercomputers can be and are used in the aircraft design industry, where flight simulation means more than just drawing a few runways and some background on a computer screen. In a pre-design test of a new aircraft, the ability to use the kind of computing power offered by the Cray to the massive number of possible conditions it might experience is essential.

At any rate, I digress. You may now know two uses of this particular dream machine but it is also important that you appreciate how select and elite the group which uses the machine has become.

US Government

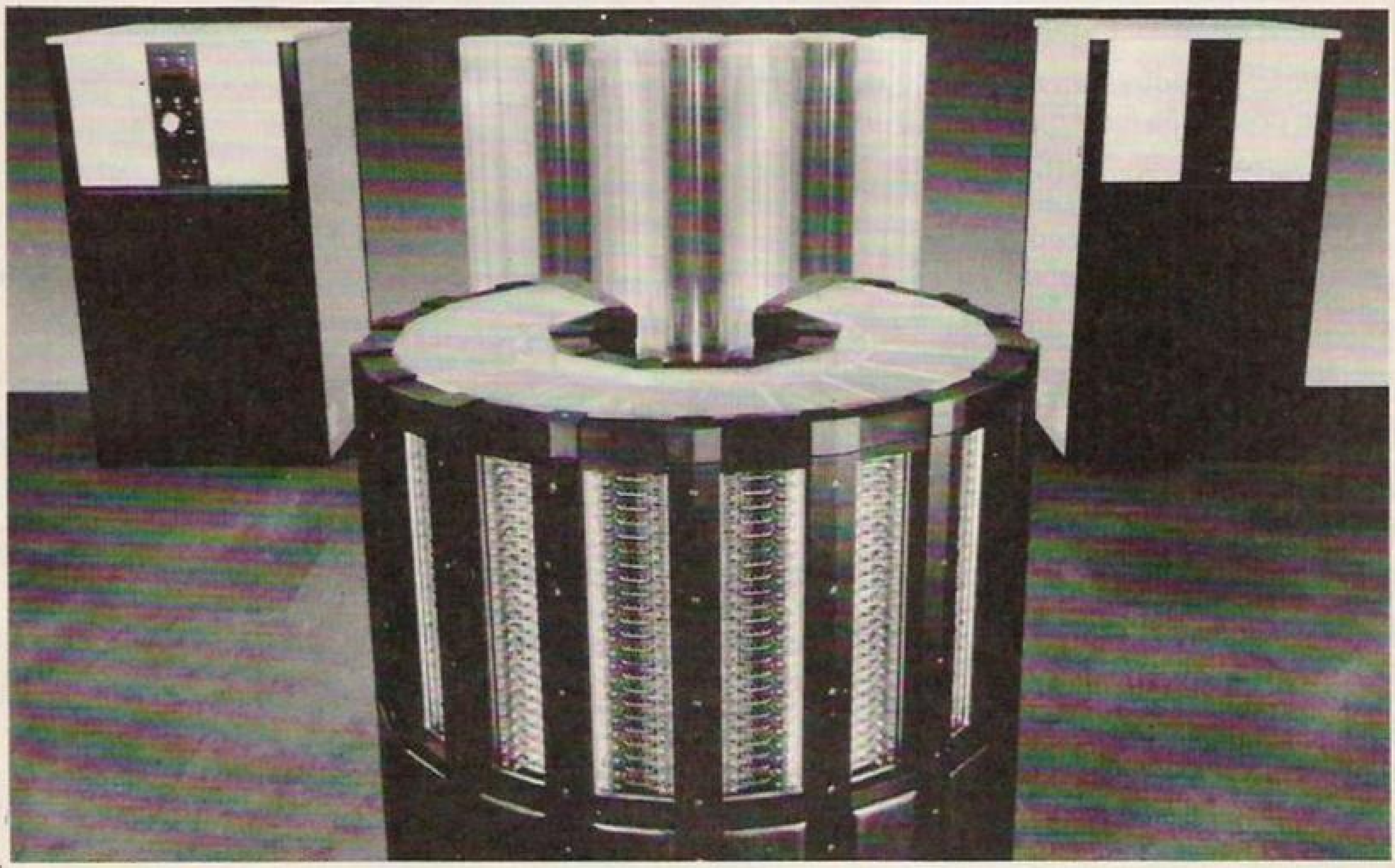
I mentioned that the U.S. government looks closely at all pssible purchasers of Cray equipment and that inspection also extends to users of the machine. When the University of London Computer Centre wanted to move a second-hand Cray 1 computer from Harwell, negotiations were needed between the British Department of Trade and Industry and the American Department of Commerce.

The U.S. government is concerned that in a university establishment there would not be sufficiently tight controls on who could and could not use of the the country's leading supercomputers.

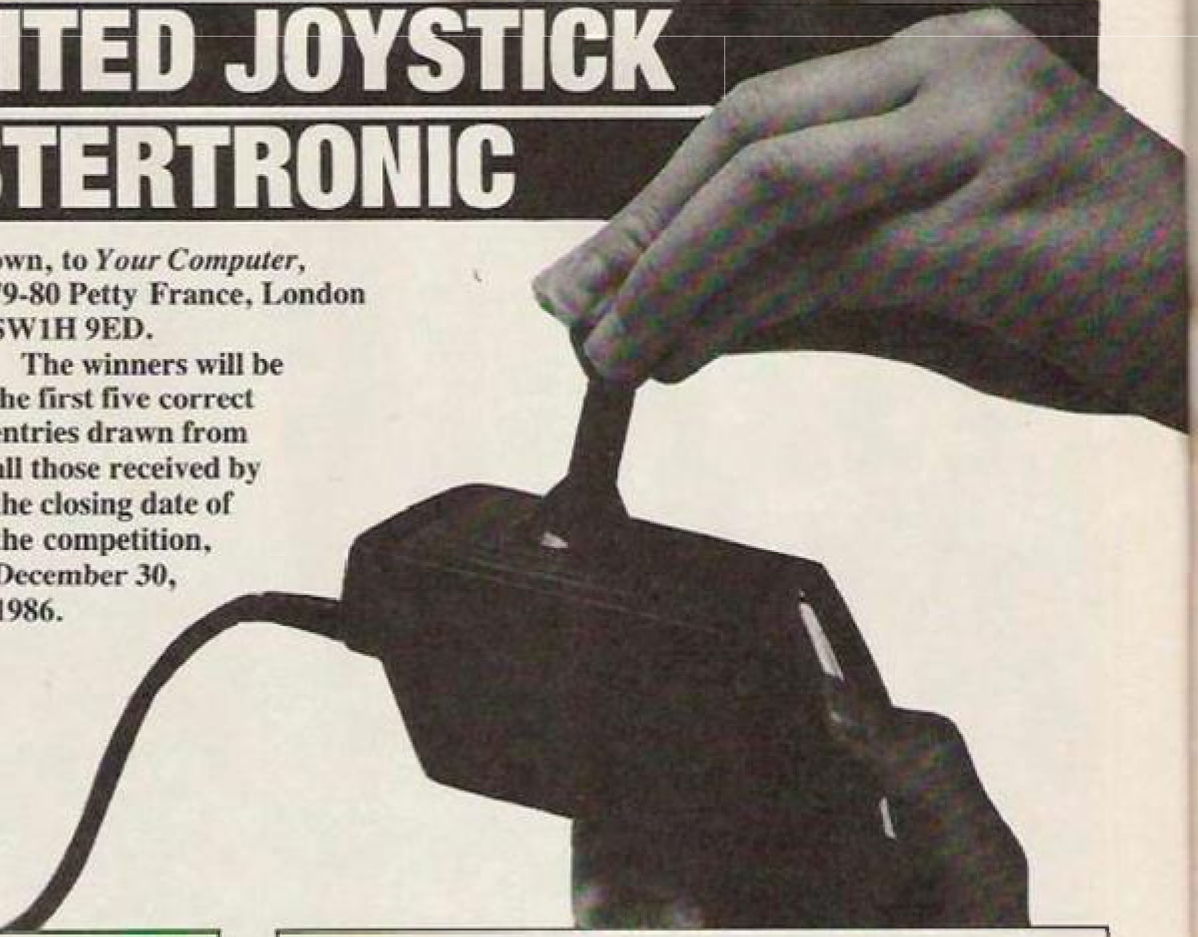
According to a recent article in the *New Scientist*, export regulations issued in the U.S. earlier this year prevent foreign owners of American supercomputers issuing passwords to nationals of 19 prescribed countries. Luckily, the U.K. is not on that list. Imagine having to show your passport every time you wanted to use the computer.

Like all good dreams, however, my reveries about the world of supercomputers must end as I leave Cray to the serious business of defending the free world from missile attacks, animating ever-better space creatures and keeping the world's new aircraft from falling from the skies – while I go back to sleep.

The Cray 2



WIN A MAGNUM, THE LONG-AWAITED JOYSTICK FROM MASTERTRONIC



More normally associated with high-quality budget games, Mastertronic is hoping that its radically different joystick will establish it in that sector. Due to be released soon, costing £14.95, the Magnum is compatible with all computers which use a standard Atari-type joystick port.

In this competition *Your Computer*, in conjunction with Mastertronic, provides the opportunity for five lucky winners to be some of the first people to have these excellent joysticks.

To win, answer the three questions below and send your answers, together with what computer you own, to *Your Computer*, 79-80 Petty France, London SW1H 9ED.

The winners will be the first five correct entries drawn from all those received by the closing date of the competition, December 30, 1986.

QUESTIONS

1. *Which musical genius wrote his first soundtrack for Mastertronic and then went on to do* Monty on the Run?
2. *Which famous film character will soon be computerised by Mastertronic?*
3. *What is the name of the £2.99 Mastertronic label?*

COMPETITION RULES

- ★ The winners of the competition will be the persons who send the first all-correct entries drawn from all those received before the closing date of the competition.
- ★ The names of the winners will be announced in the March 1987 issue of *Your Computer*.
- ★ All entries must arrive at the *Your Computer* offices by the last working day in December, 1986.
- ★ Each person may enter the competition only once.
- ★ Entries to the competition cannot be acknowledged.
- ★ No employees of Focus Magazines nor their agents or close relatives may enter the competition.
- ★ The decision of the Editor in all respects of the competition will be final.
- ★ No correspondence with regard to any aspect of the competition will be entered into.
- ★ Focus Investments assumes no responsibility or liability for any complaints arising from this competition.

MASTERTRONIC COMPETITION

Do not forget to enclose this coupon, or a photocopy of it, when you send your entry, marked Mastertronic Competition, to the *Your Computer* editorial offices at the address shown at the front of the magazine.

Answers 1 ________ 2 ________ 3 ________

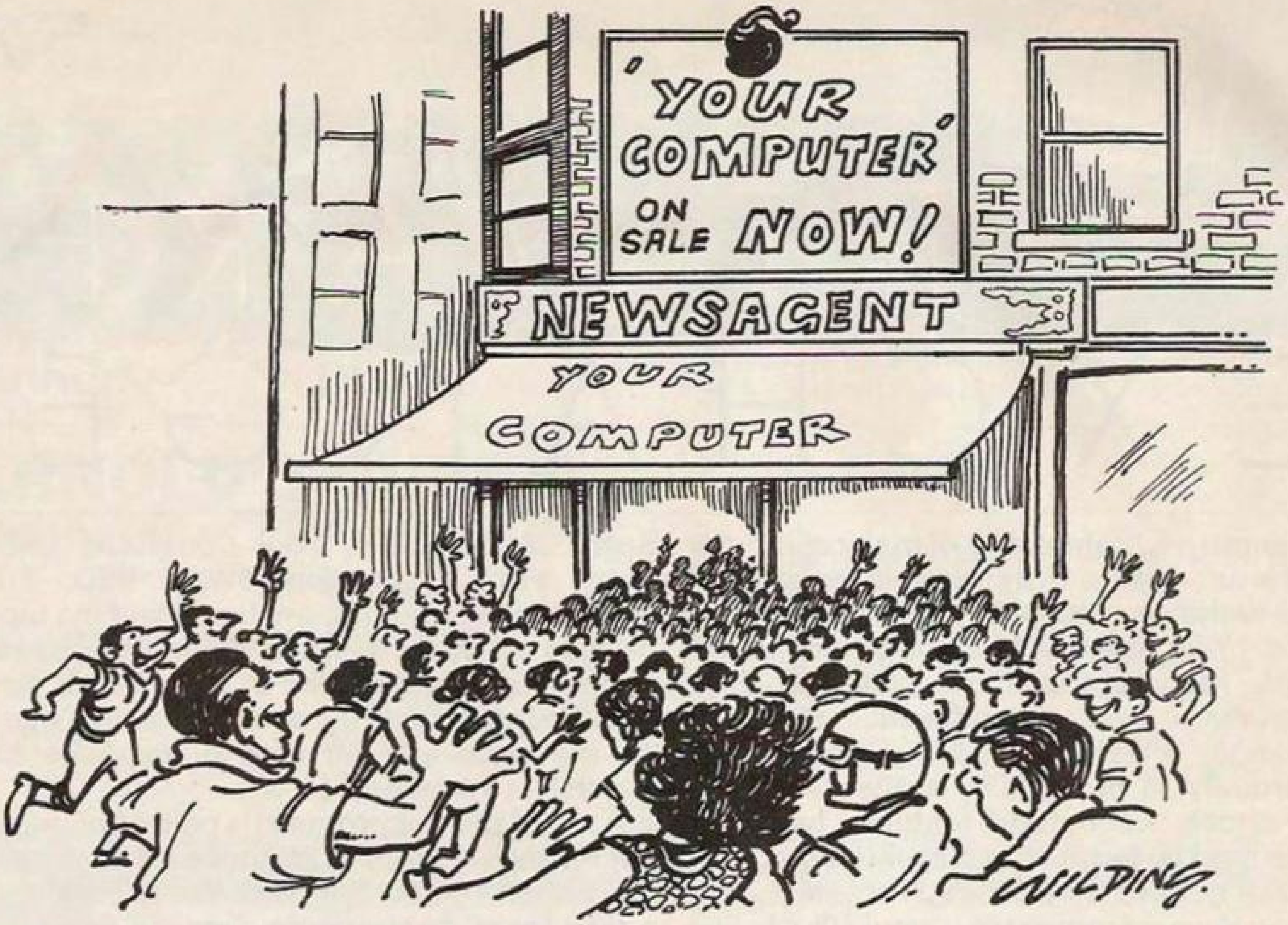
State which computer ____________________

Name ____________________ **Age** ________

Address ____________________

____

POSTCODE ____________________ **Day Tel. No** ____________________



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While the scenes at your local newsagent are unlikely to be so frantic as those depicted in our cartoon, it is a fact that copies of the latest issue of *Your Computer* disappear fast from the shelves. If you cannot go to the shops on our publication date, you could miss the mixture of news and practical features which make *Your Computer* one of the most popular home computer magazines.

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ONLY £1.99 + 40p post and packing per tape

SOFTWARE EXCHANGE

The length and complexity of many computer programs makes it impossible to publish them without occupying valuable editorial space. In an attempt to combat this and to provide readers with more software, *Your Computer* has introduced Software Exchange, a service offering readers the opportunity to buy quality software at bargain prices. Each tape features two programs sent by readers and evaluated fully by our staff before being offered for sale.

If you have a program you would like to see published in *Your Computer*, please send it to Software Exchange, *Your Computer*, 79-80 Petty France, London SW1H 9ED. Full instructions should be enclosed and the tape or disc must be marked clearly with your name, address and type of machine. It also helps considerably if contributors also mark on the envelope the type of machine for which it is intended.

A fee of £50 per program is paid after publication and royalties of 25 pence for each tape more than 100 sold is paid. We accept programs for all Commodore, Sinclair, Amstrad, Atari and Acorn machines.

CBM 13

COMMODORE

SPLISH SPLASH

Machine: Commodore 64
Program Type: Arcade
Author: Paul Greenstead

Supposedly you have fallen into a deep sleep after watching some video nasties and when you wake the house has flooded mysteriously. Fortunately there happens to be an old rowing boat in the lounge. The object is to see your boat through the gap in the floor as the water level rises. Things are not so simple as they appear, as a number of ghosts, probably encouraged by the video nasties you were watching, attempt to prevent you reaching the top floor.

The game has 15 levels, each having more ghosts than the previous one, and the game can be played with a joystick, which makes things easier. Despite the simplicity, the game is very addictive.

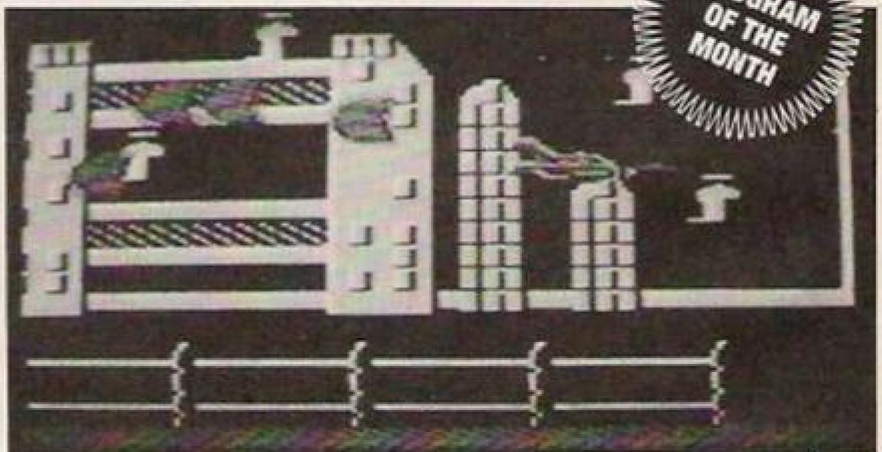
THE MISSION

PROGRAM OF THE MONTH

Machine: Commodore 64
Program Type: Shoot-'em-up
Author: Frank Tout

The Mission, not to be confused with the new Roland Joffe film, is a classic arcade-type shoot-'em-up. After a routine flight you are ordered to return to your base as there has been an alien invasion. Your flight back to base proves to be a mission in itself, with numerous aliens eager to impress their colleagues by blasting your spacecraft out of the sky.

The one great advantage you have is unlimited fire power, probably because you are the hero in this classic scenario, which is unlucky for the aliens but very good fun for you. Extra points are scored by shooting the pods which are found periodically on



the floor, as well as the usual points gained by shooting everything which attacks you. There are four sections, with each one scrolling over six screens, so there is plenty of action. The game is also a turbo loader, so there is not long to wait when you insert your cassette.

AMS 09

A M S T R A D

GUARDIAN

Machine: Amstrad CPC range
Program Type: Platform
Author: D. Lau

In a similar vein to *Arnold's Quest, Guardian* involves the collection of items from the different platforms in the game. The different screens represent the various levels of a strange building in which you are trapped. To get out of the building you have toi collect energy pills to give you strength to carry rockets which are needed to blast your way to freedom. Each floor has a pill and there are six floors to each screen. As there are 10 levels you are kept extremely busy roaming round the expansive building and need quick reflexes to get out.

ARNOLD'S QUEST

Machine: Amstrad CPC range
Program Type: Arcade Platform
Author: Martin Holland

Arnold the ape is the star of this very well-written platform game. While the object is very straightforward, it proves extremely difficult to gain respectable score Arnold has to collect all the objects on a screen without losing a life.

At the beginning of each game you are given three lives and are awarded another on completing each screen. A screen is completed when all the objects have been collected. The score is related to the time in which all the objects are gathered which, without a great deal of practice and sleepless nights, is not very high.

SP 13

S P E C T R U M

FIGHTING FORCES

Machine: Spectrum
Program Type: Strategy
Author: Lars Christensen

Fighting Forces is a war simulation and puts you in the role of a general who has to command 36 units of tanks, infantry, artillery, engineers and supplies. This two-player game is set on an island divided by a river and the object is to capture your opponents' flag, thus forcing a humiliating defeat.

Despite the apparent simplicity of the game it proves to be a very complex and long simulation, with the author thinking of every detail to make the game very realistic.

Tactics are very important and as your army's strength increases when the unit rests or moves only a few squares, the war is very much one of attrition. Perhaps the best feature is the fact that you can save your position to Microdrive and return to the reality of war when you feel suitably refreshed.

ONE-ARM BANDIT

Machine: Spectrum
Program Type: Simulation
Author: Bruce Gant

By chance another fruit machine simulation for the Spectrum is on offer in this month's Software Exchange. The game includes all the features you would expect in the arcade versions such as nudge, hold and the choice to gamble your winnings if even greater success seems likely.

A well-written screen displays all the information, with the different fruits and combinations deciding the score. In the *Your Computer* offices we spent several lunch-times playing the game, with the only criticism being that the pay-outs are rather disappointing.

MICRO MARKET

BUSINESS

◆ *Spectrum 48K* ● *C. Eyssautier*

Business is a program written to help with statistics. It has four separate routines – Block bars, three-dimensional histogram where values can be entered and a graph drawn from the data; Graphics, which is the same as Block bars except that a more precise graphic chart is drawn; Pie chart, giving values in percentages which enables the figures to be compared as proportions; and Complex bars, another 3D histogram which allows it to be divided into several parts to analyse different sections in more detail and compare them to the other parts of the graph.

The program is fast and useful for anyone who works with figures.

```
   1 REM ******************
   2 REM *   BUSINESS  © *
   3 REM *      BY        *
   4 REM * C.Eyssautier *
   5 REM ******************
   7 POKE 23658,8: GO TO 2000
   8 REM COMPLEXE BARS.
   9 PRINT INK 1;AT 0,6;"*****************************";AT 1,6;"*";AT 1,27;"*";AT 2,6;"*";AT 2,27;"*";AT 3,6;"**********************";: PRINT AT 1,10;"BLOCK GRAPHIC";AT 2,7;"OF 'N' OBSERVATIONS.": RANDOMIZE USR 61511
  10 INPUT "How many values ? ";n
  15 IF n=0 THEN GO TO 10
  20 INPUT "How many observations ? ";p
  23 IF p<1 OR p>5 THEN GO TO 20
  25 PRINT INK 3;AT 5,2;n;" VALUES.";AT 6,2;p;" OBSERVATIONS."
  30 DIM t(n,p+1)
  50 FOR i=1 TO n
  60 PRINT AT 10,2; INK 2;"Value n.";i
  70 FOR j=1 TO p: INPUT "Value: ";t(i,j)
  80 PRINT INK 0;TAB 20;t(i,j);"    ": NEXT j: PRINT AT 17,0;"Press any key for next value.": PAUSE 0: PRINT AT 17,0;"                              ": FOR v=10 TO 21: PRINT AT v,20;"      ": NEXT v
 110 NEXT i
 150 FOR i=1 TO n: LET s=0
 160 FOR j=1 TO p
 170 LET s=s+t(i,j): NEXT j
 180 LET t(i,p+1)=s: NEXT i
 220 LET s1=0
 230 FOR i=1 TO n
 240 IF t(i,p+1)>s1 THEN LET s1=t(i,p+1)
 250 NEXT i: LET s=s1
 253 INPUT "TITLE: "; LINE t$
 254 IF LEN t$>15 THEN GO TO 253
 255 PRINT AT 19,3; INK 0;"TITLE: "; INK INT (RND*7);t$: PRINT ' INK 0;"  PRESS ANY TO CONTINUE ": PAUSE 0
 260 LET a=USR 61464
 300 PLOT 0,0: DRAW 255,0: DRAW 0,175: DRAW -255,0: DRAW 0,-175
 330 LET e=INT (255/(3*n+1))
 340 LET e1=2*e+INT ((255-e-n*3*e)/n): LET s1=(175-e)/s
 350 FOR i=1 TO n
 360 DEF FN e(i)=e*i+e1*(i-1)
 370 PLOT FN e(i),0
 380 DRAW 0,t(i,p+1)*s1: DRAW e1,0: DRAW 0,-t(i,p+1)*s1
 390 DRAW .3*e1,.3*e1: DRAW 0,t(i,p+1)*s1: DRAW -.3*e1,-.3*e1: DRAW -e1,0: DRAW .3*e1,.3*e1: DRAW e1,0
 400 NEXT i
 430 DIM y(n+1,p+1)
 440 FOR b=1 TO n
 450 FOR i=1 TO p-1: LET y=0
 460 FOR j=1 TO i: LET y=y+t(b,j): NEXT j
 470 LET y(b,i+1)=y*s1
 480 PLOT FN e(b),y(b,i+1): DRAW e1,0: DRAW .3*e1,.3*e1
 490 LET d=FN e(b): LET f=d+e1
 500 LET h=y(b,i+1)-y(b,i)
 510 GO SUB 550+(i/2-INT (i/2))*44

 520 NEXT i
 530 NEXT b
 540 GO TO 3000
 580 FOR k=d TO f STEP i
 590 LET q=f-k: LET h1=h*(q>=h)+q*(q<h)
 600 PLOT k,y(b,i)
 610 DRAW h1,h1
 620 NEXT k
 630 FOR y=y(b,i) TO y(b,i+1) STEP i
 640 LET h=y(b,i+1)-y: LET h1=h*(h<e1)+e1*(h>=e1)
 650 PLOT d,y: DRAW h1,h1
 660 NEXT y: RETURN
 690 FOR k=f TO d STEP -i
 700 LET q=k-d: LET h1=h*(q>=h)+q*(q<h)
 710 PLOT k,y(b,i): DRAW -h1,h1
 720 NEXT k
 730 FOR y=y(b,i) TO y(b,i+1) STEP i
 740 LET h=y(b,i+1)-y: LET h1=h*(h<e1)+e1*(h>=e1)
 750 PLOT f,y: DRAW -h1,h1
 760 NEXT y: RETURN
1000 REM BLOCK BARS.
1010 PRINT INK 3;AT 0,8;"*************";AT 1,8;"*";AT 1,20;"*";AT 2,8;"*************"; INK 2;AT 1,9;"BLOCK BARS.": RANDOMIZE USR 61511
1020 INPUT "How many values ? ";v: PRINT AT 5,2;v;" Values:"
1030 DIM c(v): LET e=INT (240/(3*v+1)): LET e1=2*e+INT ((240-e-v*(3*e))/v)
1040 PRINT '': FOR n=1 TO v: INPUT "Value:";c(n): PRINT INK 2;"Value n.";n;"=";c(n): NEXT n
1043 INPUT "TITLE: "; LINE t$
1044 IF LEN t$>15 THEN GO TO 253
1045 PRINT '' INK 0;"TITLE:"; INK INT (RND*7);t$: PRINT ''"  PRESS ANY TO CONTINUE ": PAUSE 0
1050 REM BIGGEST VALUE
1060 LET c1=0
1070 FOR n=1 TO v
1080 IF c(n)>c1 THEN LET c1=c(n)
1090 NEXT n
1100 LET c1=(145-e)/c1
1110 RANDOMIZE USR 61464
1120 REM AXES
1130 PLOT 9,24: DRAW 246,0: DRAW -3,-3: PLOT 255,24: DRAW -3,3: PLOT 9,24: DRAW 0,151: DRAW -3,-3: PLOT 9,175: DRAW 3,-3
1140 PRINT AT 0,0;"y";AT 20,31;"x"
1145 PRINT AT 20,10; INK (INT (RND*7));t$
1150 REM BARS
1160 FOR n=1 TO v
1170 FOR h=0 TO c(n)*c1
1180 PLOT 15+e*n+e1*(n-1),25+h: DRAW e1,0: PLOT 15+e*n+e1+e1*(n-1)+.3*e1,25+h+.3*e1
1190 NEXT h
1200 DRAW -e1,0: DRAW -.3*e1,-.3*e1: DRAW e1,0: DRAW .3*e1,.3*e1
1210 PLOT 15+e*n+e1+e1*(n-1),25: DRAW .3*e1,.3*e1
1220 NEXT n
1230 GO TO 3000
1300 REM GRAPHIC.
1301 PRINT AT 0,8; INK 4;"****************";AT 1,8;"*";AT 1,22;"*";AT 2,8;"****************";AT 1,9; INK 1;"GRAPHIC CHART": RANDOMIZE USR 61511
1320 INPUT "How many values ? ";v
1325 PRINT AT 6,2; INK 3;v;" Values:"
1330 DIM c(v): LET e=INT (240/(3*v+1)): LET e1=2*e+INT ((240-e-v*(3*e))/v)
1340 PRINT '': FOR n=1 TO v: INPUT c(n): PRINT INK 2;"Value n.";n;"=";c(n): NEXT n
1343 INPUT "TITLE: "; LINE t$
1344 IF LEN t$>15 THEN GO TO 253
1345 PRINT '' INK 0;"TITLE:"; INK INT (RND*7);t$: PRINT ' INK 0;"  PRESS ANY KEY TO CONTINUE
```

PROGRAM LISTINGS

```
": PAUSE 0
1350 REM BIGGEST VALUE
1360 LET c1=0
1370 FOR n=1 TO v
1380 IF c(n)>c1 THEN LET c1=c(n)
1390 NEXT n
1400 LET c1=(145-e)/c1
1410 LET a=USR 61464
1415 PLOT 9,24: DRAW 246,0: DRAW
 -3,-3: PLOT 255,24: DRAW -3,3:
PLOT 9,24: DRAW 0,151: DRAW -3,-
3: PLOT 9,175: DRAW 3,-3
1416 PRINT AT 0,0;"y";AT 20,31;"
x"
1417 PRINT AT 20,10; INK (INT (R
ND*7));t$
1420 FOR n=1 TO v-1
1430 PLOT 15+e*n+e1*(n-1),c(n)*c
1+25
1440 PLOT 15+e*(n+1)+e1*n,c(n+1)
*c1+25
1450 DRAW (15+e*(n)+e1*(n-1)-(15
+e*(n+1)+e1*(n))),(c(n)*c1+25)-(
c(n+1)*c1+25)
1460 NEXT n
1470 GO TO 3000
1500 REM PIE CHART.
1501 PRINT AT 0,10; INK 6;"*****
*******";AT 1,10;"*";AT 1,21;"*"
;AT 2,10;"************";AT 1,11;
 INK 3;"PIE CHART.": RANDOMIZE U
SR 61511
1510 INPUT "How many values ? ";
v: LET v1=v
1515 PRINT AT 5,2;v;" Values:"
1520 DIM c(v,2): LET s=0
1530 PRINT '': FOR n=1 TO v: INP
UT "Value:";c(n,1): PRINT "Value
 n.";n;"=";c(n,1): LET s=s+c(n,1
): NEXT n
1540 LET c(1,2)=PI/2
1550 FOR n=2 TO v: LET c(n,2)=c(
n-1,2)+c(n-1,1)/s*2*PI: NEXT n
1560 INPUT "TITLE: "; LINE t$
1565 IF LEN t$>14 THEN GO TO 253
1570 PRINT ' FLASH 1; INK 1;"VAL
UES IN % :"; FLASH 0:: PAUSE 0:
PRINT '': FOR n=1 TO v: PRINT INK
 2;"Value n.";n;"=";INT (c(n,1)/
s*10000)/100;" %": NEXT n
1573 PRINT ' INK 0;"TITLE:"; INK
 INT (RND*7);t$: PRINT ' INK 0;"
  PRESS ANY KEY TO CONTINUE     ":
 PAUSE 0: LET a=USR 61464
1575 PRINT AT 1,0; INK (INT (RND
*6));t$
1580 REM COUNTING
1590 DIM t(v+3,2)
1600 LET r=PI: LET b=1: LET t(1,
2)=PI/2
1610 FOR k=2 TO v
1620 LET b=b+1
1630 IF c(k,2)<r THEN LET t(b,2)
=c(k,2): LET t(b-1,1)=k: NEXT k:
 GO TO 1660
1640 IF c(k,2)=r THEN LET t(b-1,
1)=k: LET t(b,2)=c(k,2): LET r=r
+PI/2: NEXT k: GO TO 1660
1650 IF c(k,2)>r THEN LET t(b,2)
=r: LET r=r+PI/2: LET t(b-1,1)=k
: GO TO 1620
1660 CIRCLE 168,88,87
1670 FOR n=1 TO v: PLOT 168,88:
DRAW 87*COS c(n,2),87*SIN c(n,2)
: NEXT n
1680 REM HATCHING
1690 FOR k=1 TO b-1
1700 LET z=(t(k,2)+t(k+1,2))/2
1710 LET d=(COS z+SIN z<0)
1720 LET e=87*SIN t(k+d,2)
1730 LET f=87*SIN t(k+1-d,2)
1740 LET u=COS t(k+1-d,2)/SIN t(
k+1-d,2)
1750 LET q=(t(k,1)-1)/3
1760 LET o=(q-INT q)*3+1
1770 LET p=o*SGN SIN z
1780 LET w=SGN COS z
1790 IF e=0 THEN LET n=0: GO TO
1860
1800 LET v=COS t(k+d,2)/SIN t(k+
d,2)
1810 REM PARTS
1820 FOR n=0 TO e STEP p
1830 LET l=n*v-n*u
1840 PLOT 168+n*u,n+88: DRAW .95
*l,0
1850 NEXT n
1860 FOR n=n TO f STEP p
1870 LET l=w*SQR (7569-n*n)-v*n
1880 PLOT 168+n*v,n+88: DRAW .98
5*l,0
1890 NEXT n
1900 NEXT k
1910 GO TO 3000
2000 REM PRESENTATION+INSTRUCTIO
NS
2001 CLS : POKE 23658,8
2005 INK 6: PRINT AT 0,0;"▛";AT
21,0;"▙": FOR a=1 TO 30: PRINT A
T 0,a;"▀";AT 21,a;"▄": NEXT a: P
RINT AT 0,31;"▜";AT 21,31;"▟": F
OR a=1 TO 20: PRINT AT a,0;"▌";A
T a,31;"▐": NEXT a
2010 LET m=0: FOR a=0 TO 49: PRI
NT INK m;AT 3,10;"MINI-BUSINESS"
;AT 5,13;"PROGRAM.": LET m=m+1:
IF m=6 THEN LET m=0
2015 NEXT a
2020 INK 0: FOR n=10 TO 22: PRIN
T AT 4,n;"-";: NEXT n
2030 FOR n=13 TO 20: PRINT AT 6,
n;"-";: NEXT n
2040 LET q=1: FOR a=10 TO 16 STE
P 2: PRINT INK 2;AT a,2;a-8-q: L
ET q=q+1: NEXT a
2045 INK 3
2050 FOR a=92 TO 43 STEP -16: CI
RCLE INK 2;20,a,6: NEXT a
2060 PRINT AT 10,4;"BLOCK BARS."
2070 PRINT AT 12,4;"GRAPHICS."
2080 PRINT AT 14,4;"PIE CHART."
2090 PRINT AT 16,4;"COMPLEXE BAR
S."
2100 INK 0: PRINT AT 19,4;"C.EYS
SAUTIER    © 1985"
2105 RANDOMIZE USR 61511: RANDOM
IZE USR 61440
2200 INPUT "Your choice ? >"; LI
NE a$
2205 LET pv=1*(a$="1")+2*(a$="2"
)+3*(a$="3")+4*(a$="4")
2210 LET go=8*(a$="4")+1000*(a$=
"1")+1300*(a$="2")+1500*(a$="3")
: GO TO 2230
2220 GO TO 2200
2230 LET a=USR 61464: GO TO go
3000 INPUT "COPY/PRINT VALUES/ME
NU ? >"; LINE b$
3005 IF b$="B" THEN RANDOMIZE US
R 61511: GO TO 3000
3010 IF b$="C" THEN COPY : GO SU
B 3500: GO TO 3000
3020 IF b$="P" THEN GO TO 3050
3045 IF b$="M" THEN LET a=USR 61
464: RANDOMIZE USR 61452: GO TO
2200
3050 IF pv=1 THEN FOR n=1 TO v:
LPRINT "Value n.";n;"=";c(n): NE
XT n: GO TO 3000
3060 IF pv=2 THEN FOR n=1 TO v:
LPRINT "Value n.";n;"=";c(n): NE
XT n: GO TO 3000
3070 IF pv=3 THEN FOR n=1 TO v1:
 LPRINT "Value n.";n;"=";c(n,1):
 LPRINT "  ";INT (c(n,1)/s*10000
)/100;" %": NEXT n: GO TO 3000
3080 IF pv=4 THEN GO TO 3600
3090 GO TO 3000
3500 IF pv=4 THEN LPRINT 'TAB 9;
t$: RETURN
3505 RETURN
3600 LET i=1
3610 FOR j=1 TO p: IF j>1 THEN G
O TO 3630
3620 LPRINT "Value n.";i;"=";t(i
,j): NEXT j
3627 STOP
3630 LPRINT TAB 10;t(i,j): NEXT
j
3640 LET i=i+1: IF i=n+1 THEN GO
 TO 3000
3650 GO TO 3610
3700 STOP
4000 CLEAR 61439: LOAD ""CODE 61
440
4010 GO TO 1
5000 REM SAVE:61440-61451;LOAD:6
1452-61463;FADE OUT:61464-61510;
BOLD SCREEN:61511-61527;90 BYTES
9999 CLEAR : SAVE "BUSINESS" LIN
E 4000: SAVE "m/c"CODE 61440,90:
 VERIFY "": VERIFY ""CODE
```

MICRO MARKET

BOATRACE

◆ Commodore 64 ● Allan McHarg

Boatrace is essential for everyone who enjoys a flutter. The object is to increase the £5 stake you receive at the start into a more substantial sum.

Rather than betting on horses, the game is about boat racing. With four lanes the game can be played by up to four players but the computer also allows the solo player to bet, which is invaluable if you want to practise and beat your future opponents.

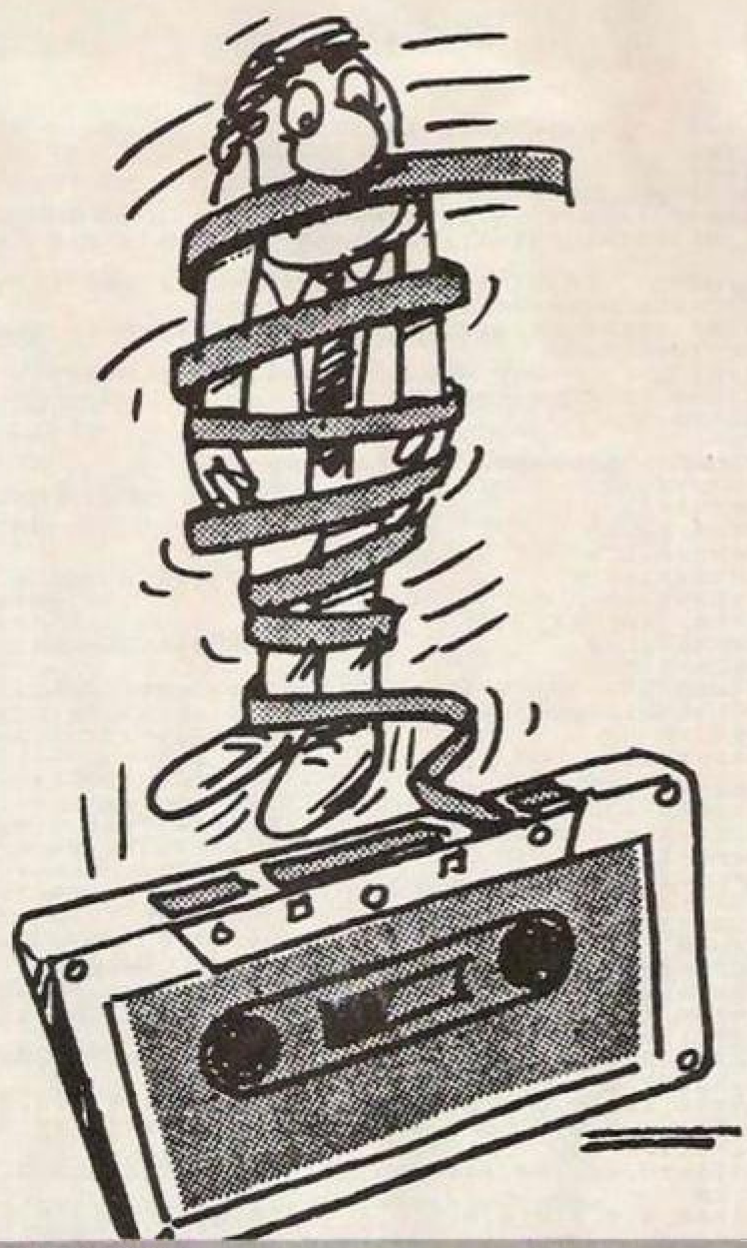
Once all the bets have been placed it is possible to follow the progress of the race on the monitor. Unlike the real world there is no possibility of injecting steroids into any of the competitors, so the computer is the only one who can influence the race.

```
10 POKE53280,0:POKE53281,0
15 DIMY%(5):DIMW(5)
16 PRINTCHR$(8)
20 GOSUB 1000:GOSUB600:GOSUB500
30 PRINT"▮▮▮"
50 V=53248:POKEV+21,124:FORF=2042TO2047:POKEF,200:NEXTF
55 POKEV+28,124:POKEV+37,2:POKEV+38,3
60 FORF=41TO46:POKEV+F,F-30:NEXTF
70 M$="▮                                  "
90 FORF=1TO5:LETY%(F)=45:NEXTF
100 PRINT"▮";:FORF=0TO37:PRINTCHR$(28)"●";:NEXT:PRINT"▮";
105 FORF=0TO39:PRINTCHR$(150)"●";:NEXT
110 FORF=0TO39:PRINTCHR$(153)"┬";:NEXT
120 PRINTCHR$(30)"▮";M$
130 FORF=5TO19:PRINT"▮";:PRINTCHR$(31)M$:NEXT
140 FORF=1TO2:PRINTCHR$(30)"▮";M$:NEXT
145 PRINT"▮▮▮▮▮▮▮▮":FORF=1TO5:PRINTCHR$(18)CHR$(31);"▮";F:PR
INT:PRINT:NEXTF
150 PRINT"▮▮▮▮▮▮▮"
160 FORG=1TO5:PRINT"▮▮▮";:FORF=0TO18:PRINTCHR$(31)"▮ –";:NEX
TF:PRINT"▮";:NEXTG
170 D=108:FORF=2TO7:POKEV+(F*2),45:POKEV+(F*2)+1,D+F:D=D+22:
NEXTF
190 D=108:FORF=2TO6:IFY(F-2)<253THENPOKEV+(F*2),Y%(F-1):POKE
V+(F*2)+1,D+F
191 LETD=D+22:NEXTF
192 AM=10:JM=220:GOSUB911
199 FORG=1TO3
200 FORF=1TO5:LETY%(F)=Y%(F)+(2*RND(1))*8:NEXT
205 FORF=2042TO2047:POKEF,200:NEXTF
210 D=108:FORF=2TO6:IFY%(F-1)<252THENPOKEV+(F*2),Y%(F-1):POK
EV+(F*2)+1,D+F
220 LETD=D+22:NEXTF
224 FORF=0TO40:NEXTF
225 FORF=2042TO2046:IFY%(F-2041)<2000THENPOKEF,201
226 NEXTF
227 GOSUB900
230 D=108:FORF=2TO6:IFY%(F-1)<252THENPOKEV+(F*2),Y%(F-1):POK
EV+(F*2)+1,D+F
240 LETD=D+22:NEXTF
250 FORF=0TO40:NEXTF
260 FORF=1TO5:IFY%(F)>252ANDY%(F)<2000THENLETY%(F)=999+F:AM=
25:JM=255:GOSUB911
261 IFY%(F)=999+FTHENLETW(G)=F:LETY%(F)=2000:NEXTG:GOTO350
265 NEXTF
290 GOTO200
300 END
350 POKEV+21,0
354 PRINT"▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮POSITIONS":PRINT"▮▮▮▮▮▮▮▮"
355 PRINTCHR$(5)"▮▮▮▮▮▮▮▮▮▮▮▮▮▮1ST PLACE ";W(1)
356 PRINT"▮▮▮▮▮▮▮▮▮▮▮▮▮▮2ND PLACE ";W(2)
360 PRINT"▮▮▮▮▮▮▮▮▮▮▮▮▮▮3RD PLACE ";W(3)
365 FORF=1TOA:IFC(F)=W(1)THENLETT%(F)=T%(F)+B(F)+INT(2*B(F))

370 IFC(F)=W(2)THENLETT%(F)=T%(F)+B(F)+INT(.5*B(F))
375 IFC(F)=W(3)THENLETT%(F)=T%(F)+B(F)+INT((1/3)*B(F))
376 NEXTF
380 FORF=0TO1400:NEXTF:GOSUB540:GOTO30
500 PRINT"▮▮▮▮▮▮▮▮▮▮▮▮▮HOW MANY PLAYERS WISH TO PLAY"
510 INPUTA
520 IFA<1ORA>8THEN510
525 DIMN$(A):DIMT%(A):DIMC(A):DIMB(A)
530 FORF=1TOA:PRINT"▮▮▮▮▮▮▮▮▮▮▮ENTER PLAYER ";F;"S NAME":INPU
TN$(F):NEXTF
535 FORF=1TOA:LETT%(F)=10:NEXTF
540 PRINT"▮▮▮▮":FORF=1TOA:PRINT"▮▮▮▮▮▮▮▮▮▮▮▮";N$(F);" HAS £";
T%(F):NEXTF
541 NO=0:FORF=1TOA:IFT%(F)=0THENNO=NO+1
542 IFNO=ATHEN700
543 NEXTF
545 PRINT"▮▮":FORF=1TOA:PRINTN$(F);" ENTER YOUR BET PLEASE "
:INPUT"£";B(F)
547 IFB(F)>T%(F)THENPRINT"TOO MUCH PLEASE TRY AGAIN":GOTO545
```

```
550 LETT%(F)=T%(F)-B(F)
555 PRINT"□□":PRINT"NOW ENTER THE BOAT ON WHICH YOU WANT TO
BET (1-5)":INPUTC(F)
560 NEXTF
570 RETURN
600 PRINT"□";:PRINTCHR$(152)"                    BOAT-RACE"
605 PRINT
610 PRINT"              BY A.MCHARG"
620 PRINT"□□□□□"
630 PRINT" THIS IS A BETTING GAME FOR 1 TO 8      PLAYERS."
640 PRINT:PRINT:PRINT" YOU START OFF WITH £10 EACH.BET ON EA
CH"
650 PRINT"□";:PRINT"BOAT,WATCH THE RACE AND IF YOUR LUCKY,
COLLECT YOUR WINNINGS."
670 PRINT:PRINT:PRINT"          PRESS RETURN TO START"
680 INPUTZ:RETURN
700 PRINT"□";"   YOU HAVE ALL LOST YOUR MONEY             PR
ESS RETURN TO PLAY AGAIN"
710 INPUTA
720 RUN
900 FORL=54272TO54296:POKEL,0:NEXT
901 S=54272
902 FORZ=1TO3
903 POKES+24,15
904 POKES+4,129
905 POKES+5,15
906 POKES+1,40
907 POKES,200:NEXT
908 POKES+4,128
909 POKES+5,0
910 RETURN
911 FORL=54272TO54296:POKEL,0:NEXT
912 S=54272
913 FORZ=1TO30
914 POKES+24,15
915 POKES+4,33
916 POKES+5,9:POKES+6,0
917 POKES+1,10
918 POKES,JM:NEXT
919 POKES+4,128
920 POKES+5,0
921 RETURN
1000 FORF=12800TO12800+62:READQ:POKEF,Q:NEXTF
1001 FORF=12864TO12864+62:READQ:POKEF,Q:NEXTF:RETURN
1010 DATA0,192,0,3,192,0,0,192,0,0,48,0,2,181,128,42,173,168
,170,165,170,170
1020 DATA149,170,42,174,168,130,186,160,34,50,32,8,200,128,3
,192,0,3,192,0
1030 DATA0,192,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
1040 DATA0,0,0,0,0,60,0,0,48,0,0,192,2,171,128,42,173,168,17
0,165,170,170,149
1050 DATA170,42,174,168,130,171,136,34,32,224,8,136,176,0,0,
12,0,0,60
1060 DATA0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
READY.
```





MASTERMIND

◆ Amstrad CPC range ● N. Hamilton

Mastermind is perhaps one of the all-time favourites among home computer programmers. Usually the program is extremely basic and to win the hidden colours have to be found in about seven or eight attempts.

This version for the Amstrad CPC range has all those features but also incorporates the same scoring system as the board game – a white peg to indicate the correct colour in the correct place and a black peg to indicate the correct colour in the wrong place.

While this game is not on a par with many of the arcade-type games we publish, it is very well-written and is a good example of successful home programming.

```
10 '**** MASTER-MIND ****
20 MODE 1
30 INK 0,15:INK 1,1
40 DIM g(4),ans(4)
50 CLS
60 FOR i=1 TO 4
70 ans(i)=INT(RND*6)
80 NEXT i
90 LOCATE 14,2:PRINT" MASTER-MIND"
100 PRINT:PRINT"     You have to guess a fou
```

```
r digit"
110 PRINT" number. Each digit must be betwe
en"
120 PRINT" 0 and 5 e.g. 2501 or 4431."
130 PRINT"      You will be allowed a maximu
m "
140 PRINT"  of 12 guesses!"
150 PRINT
160 FOR g=1 TO 12
170 bl=0:wh=0
180 LOCATE 2,g+8
190 PRINT "  Enter guess ";g;" ";:LOCATE 20
,g+8:INPUT "- ", guess$
200 IF LEN(guess$)<> 4 THEN PRINT" Invalid
entry - try again ":GOTO 180
210 FOR j=1 TO 4:g(j)=ASC(MID$(guess$,j,1))
-48
220 IF g(j)<0 OR g(j)>5 THEN PRINT" Invalid
 - try again ":GOTO 180
230 NEXT j
240 LOCATE 26,g+8:PRINT USING "&"; SPACE$(2
00)
250 FOR k=1 TO 4:IF g(k)=ans(k)THEN bl=bl+1
260 IF bl=4 THEN LOCATE 2,22:PRINT" Well do
ne - you guessed correctly. ":GOTO 440
270 NEXT k
280 FOR w=1 TO 4
290 FOR x=1 TO 4
300 IF ans(w)=g(x) THEN wh=wh+1:g(x)=6:GOTO
 320
310 NEXT x
320 NEXT w
330 wh=wh-bl
340 LOCATE 27,g+8
350 PEN 2:INK 2,0
360 IF bl<1 THEN 380
370 FOR c=1 TO bl:PRINT USING "&"; CHR$(143
);" ";:NEXT c
380 IF wh<1 THEN 400
390 PEN 3:INK 3,26:FOR c2=1 TO wh:PRINT CHR
$(143);" ";:NEXT c2
400 PEN 1
410 NEXT g
420 PRINT:PRINT:PRINT" Bad luck! The answer
 is ";ans(1);ans(2);ans(3);ans(4)
430 '
440 PRINT:PRINT" Do you want to play again
(y/n)  ";
450 a$=INKEY$:ON INSTR(" yn",LOWER$(a$)) GO
TO 450,50,470
460 GOTO 450
470 STOP
```

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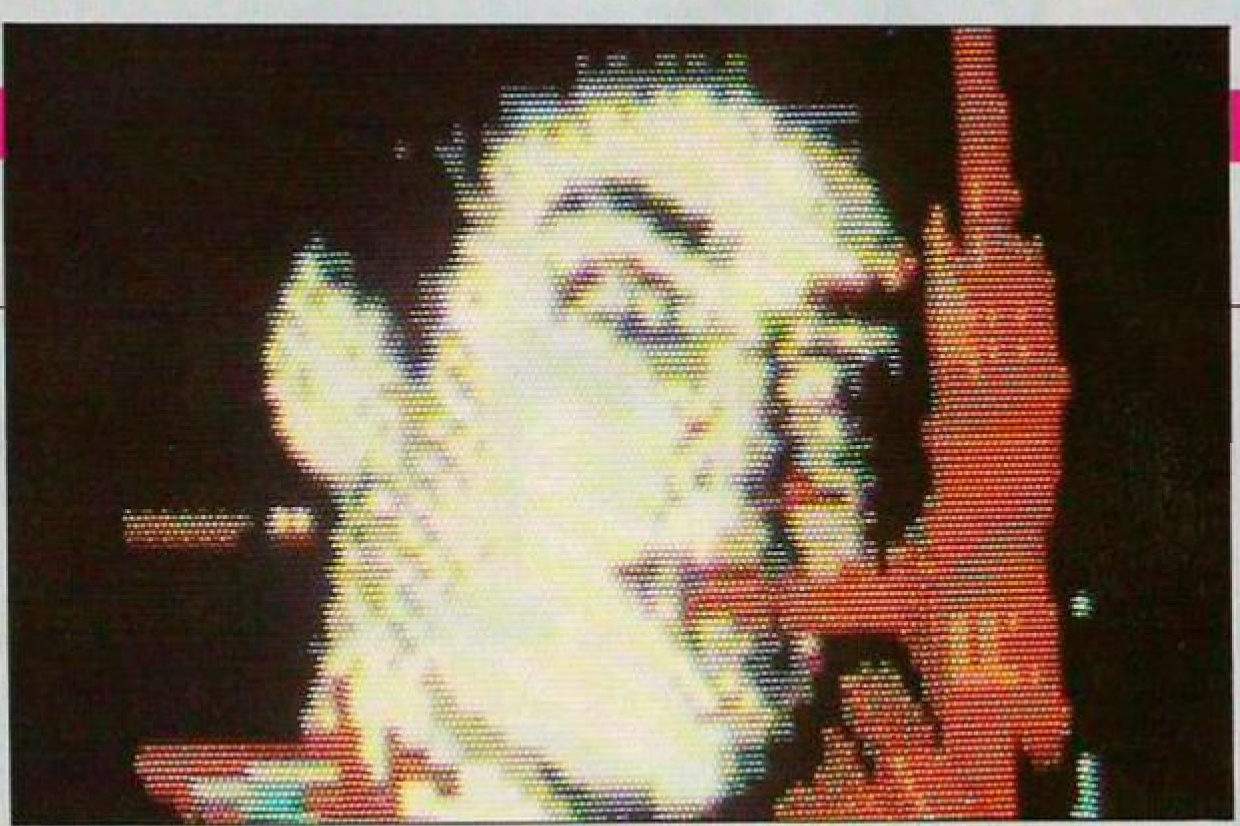
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Dracula, horrifying.

THE LEADING EDGE

One of the few companies to preach innovation, CRL has made hits from some very diverse ideas. Francis Jago visited the company to see how it plans for 1987.

When the company was launched, founder Clement Chambers named it Computer Rentals Ltd. The rest is part of computer industry folk-lore. In 1982, Chambers advertised in *Your Computer* for games on the Spectrum or ZX-81 and started to market them shortly afterwards.

In the days when Imagine and Quicksilva reigned supreme, CRL was going happily about the business of selling games, not in massive quantities but sufficient to establish itself as a good and reliable software house. In July, 1984, Chambers decided CRL had to expand, if its growth was to continue, and the move to bigger premises coincided with the company going public.

It was in 1985 that CRL became recognised as one of the more influential software houses, with releases such as *Juggernaut* and *The Rocky Horror Show* doing well in the charts. As has always been the case with CRL, ideas it had created a stir and the soundtrack for The Rocky Horror Show, created by Clever Music, was one of the first true game soundtracks.

When CRL released *Tau Ceti,* without the blaze of glory which would have been the norm with the larger companies, it was recognised unanimously as one of the most impressive games of 1985-6 and established its programmer, Peter Cooke, as one of the most-sought-after talents in the industry.

To allow CRL to develop more diversely, 1986 marked the creation of two more labels. The first was Nu Wave which allows CRL to release products which otherwise would not see the light of day. The programs are not always games but can best be described as interactive computer experiences. Both *iD* and *Tubular Bells* created great interest, with iD becoming a firm favourite for many otherwise non-games players.

As now seems to be usual with any software house, CRL has also started a budget labe', Alpha-Omega, which can only help to consolidate the market penetration CRL has achieved. If early 1986 proved to be a time of boom for CRL – and judging by the new and greatly improved offices it did – Christmas 1986 and early 1987 should mark the continuation of the trend.

One of the most eagerly-awaited of the new CRL games is *Cyborg,* which has been in the pipeline for almost 18 months. Although the release date has again been delayed because of programming difficulties, the game should be in the shops any time now. Cyborg is part one of a trilogy continuing the Tau Ceti theme and using some of the same 3D techniques which made the former graphically so impressive.

Flying high

Programmed in-house, Cyborg is half-man, half-robot, built by the Galcorp after his remains were found in a wrecked skimmer. Cyborg is then trained to be a top secret agent for the military. In his first mission, his task is to discover what has happened to a group of scientists who set off in a craft in an attempt to prevent an asteroid destroying earth. As Cyborg, you will discover a maze of underground tunnels inside that fateful asteroid, as well as some aliens who would be happier if you were dead.

Another development of Tau Ceti is *Academy,* Cooke's much-vaunted sequel. Already rumours are rife that the game is better than the original and from what I have seen that may be so. In Academy you take the role of a trainee fighter pilot who has enrolled on the Galcorp equivalent of *Top Gun.* At the Academy you will design your own skimmer and learn to fly it to the limits in 20 practice missions.

If flying through an imagi-



In Bugsy you are a three-foot tall rabbit.



Design your own skimmer with Academy.

nary 3D space pilot training scheme is not your idea of fun, perhaps *Dracula* is. Programmed by Rod Pike, the man responsible for the excellent if a little disturbed *Pilgrim*, this adventure promises to be the most horrific of all time and, consequently, CRL has asked for the game to be censored.

Originally a text-only adventure, the potential for digitised pictures was soon realised and, after a few months' work and a great deal of colouring with red ink, the result is spine-chilling to say the least and certainly does justice to the Bram Stoker original.

Another aspect of CRL which has proved successful is relationship with other less powerful software houses. Two names which have achieved success due to CRL are Delta 4, the company behind a series of amusing spoof adventures, and St. Brides' Software, another less than serious software house.

St. Brides appears to be going from strength to strength and its latest release, *Bugsy*, promises to succeed where other more powerful software houses categorically failed. The game places you in the role of Bugsy, a gangster. Unlike most other gangsters, however, you are 3ft. tall and a rabbit. Do not let that minor detail affect you for your intention is to be the most powerful gangster since Al Capone.

Starting with nothing but a small-time protection racket, you must build a crime ring, hire the proper personnel and prevent other gangs nosing into your business. The police might cause a few problems, too. With excellent graphics and some witty text, Bugsy promises to be an adventure for all the family to spend hours playing.

One of the last games CRL plans to release in the next few months is *Death or Glory*. Using similar mettalix graphics which made programs such as *Uridium* and *Sanxion* such successes, the game takes the genre one step further, with some of the fastest scrolling yet seen on the Commodore 64.

In an attempt to create a feeling of reality, the speed is portrayed not just by backgrounds whizzing past but if you continue in a straight enough line, the background starts to strobe and it appears that the ship is travelling backwards rather than forwards.

Both the game play and the graphics of Death or Glory were only provisional but there seemed to be sufficient there to promise a game of high quality.

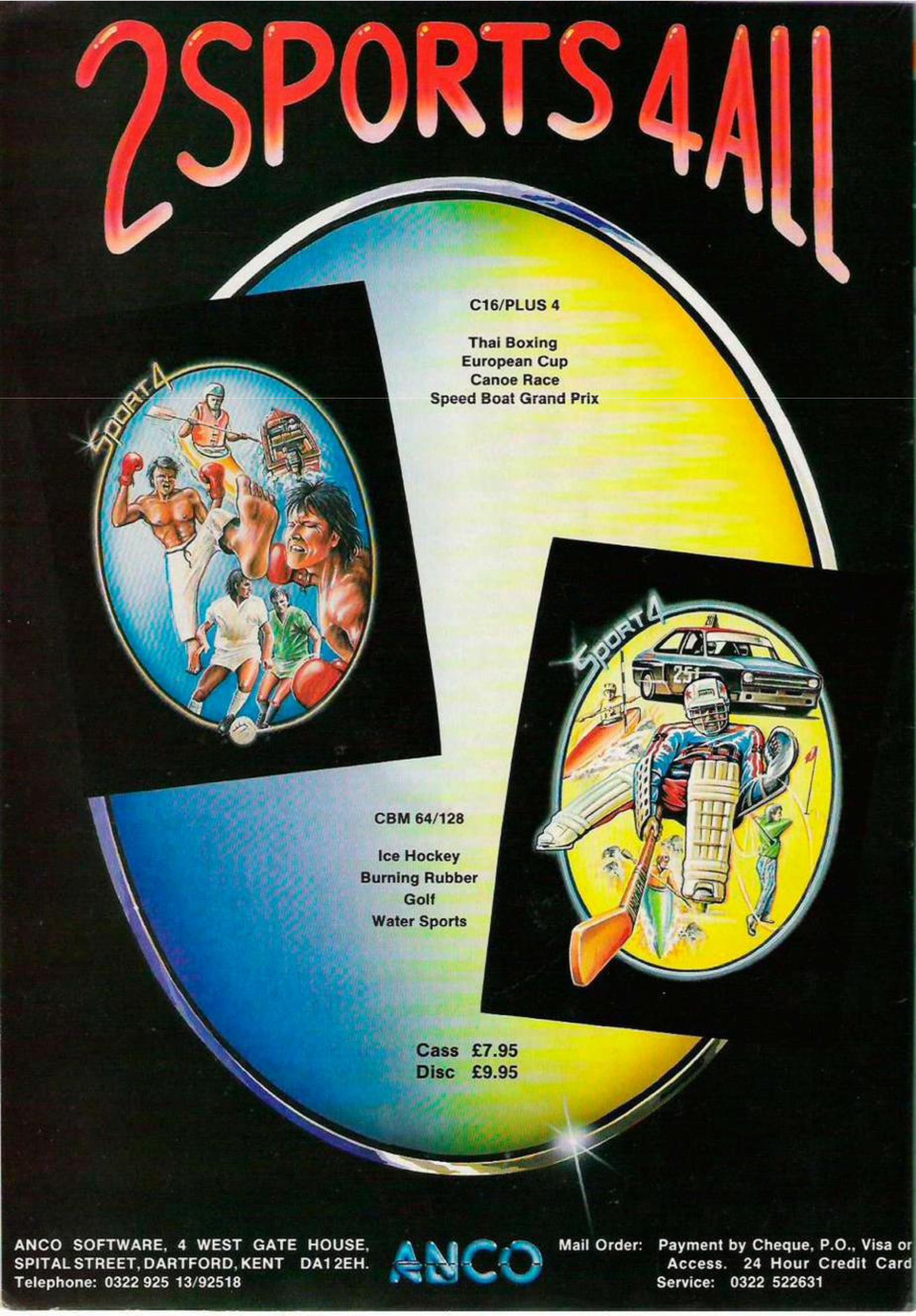
What becomes very apparent from any visit to CRL is the feeling of a community, something many bigger software houses lack. CRL maintains that the feeling is because of the ability of Chambers to make everyone feel as if the company is their responsibility.

In four years, CRL has gone from nothing to being one of the top six software houses in the industry. From advertising in the *Your Computer* classified section to being written about in the editorial – that is full circle.

Cyborg continuing the Fau Ceti theme.



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In the run-up to Christmas, CRL plans to release a host of programs which will serve further to enhance its reputation for quality software. *Cyborg* for the Commodore and *Academy* for the Spectrum are two of the most eagerly-anticipated games and both these are included as prizes.

In this competition *Your Computer* will give away one stocking containing an attractive T-shirt and a CRL game to a Spectrum, Commodore and Amstrad owner answering the questions correctly.

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2. *Which Nu Wave game featured Ian Dury and Jon Pertwee?*
3. *Where is CRL based?*

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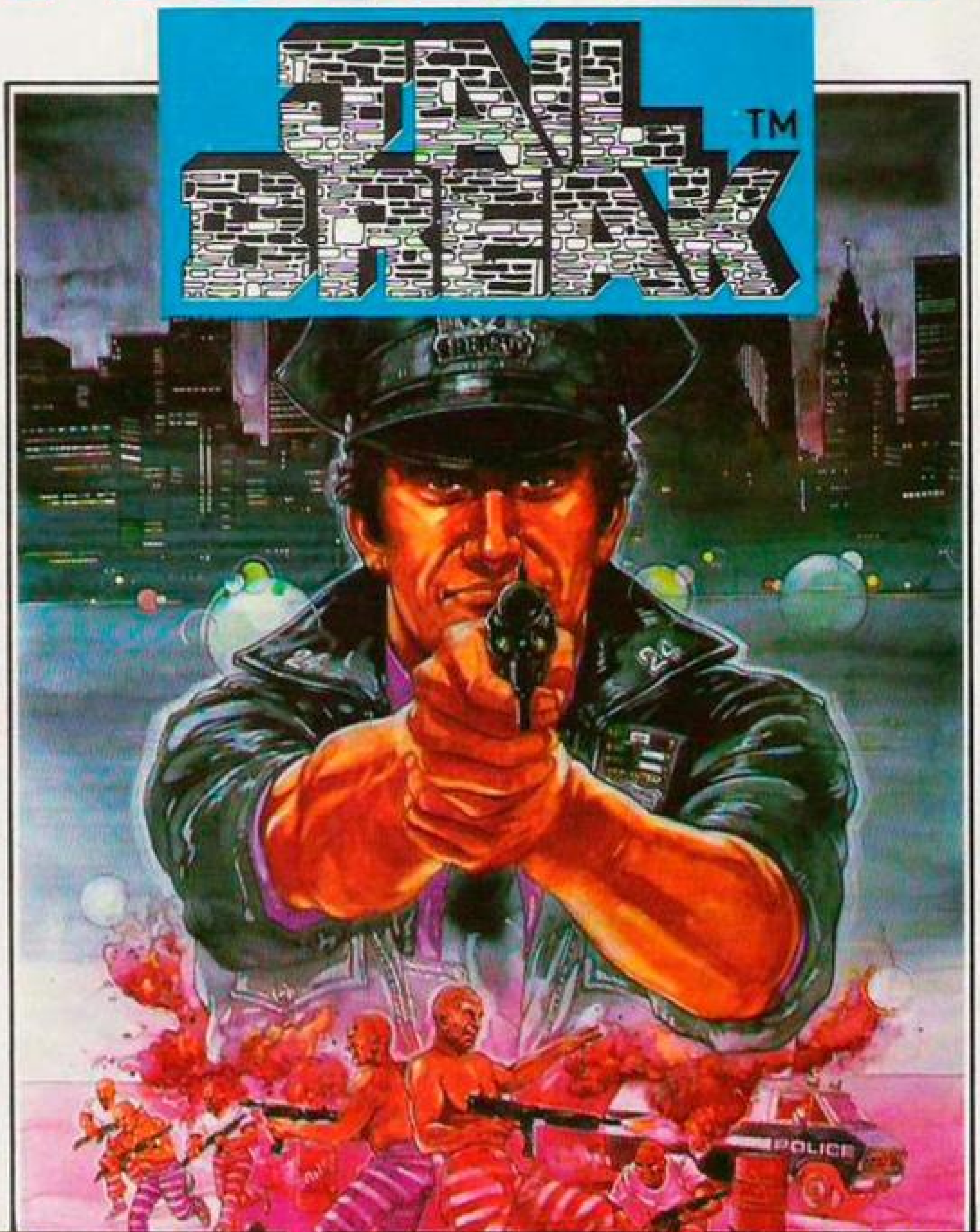
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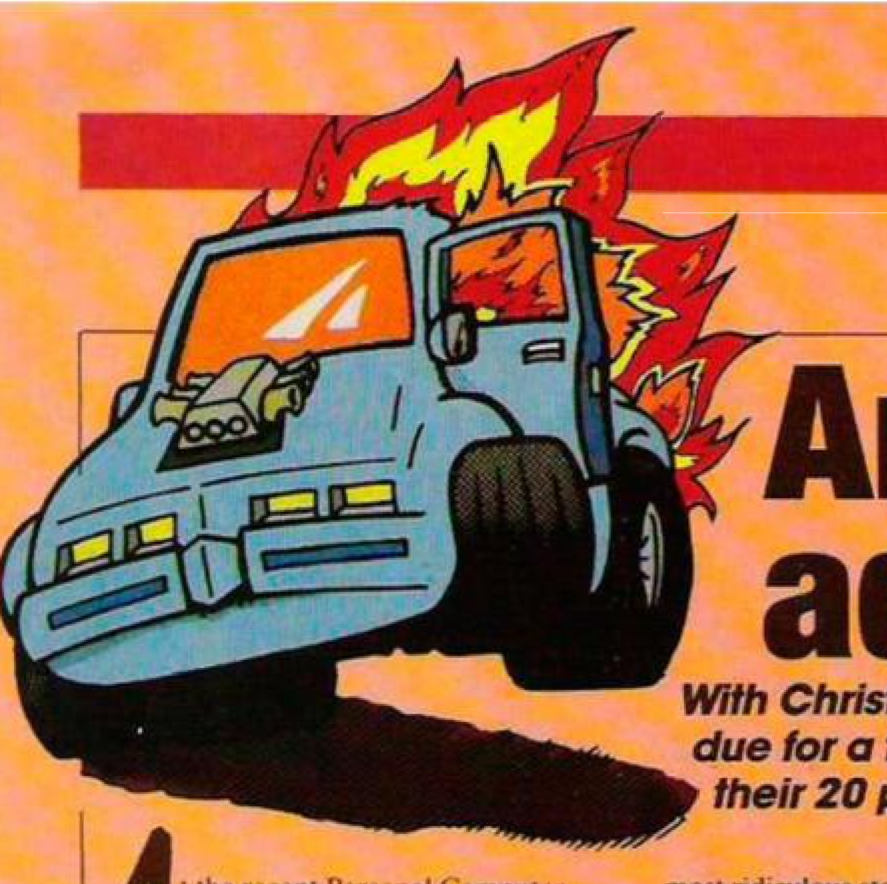
Screen shots from Arcade version

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Arcade adventures

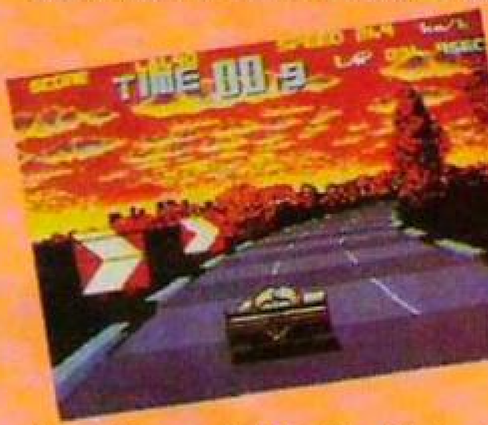


With Christmas fast approaching, arcade fans are due for a treat when they look for a way to spend their 20 pences. Francis Jago checks the latest arcade smashes.

At the recent Personal Computer World Show, I stood behind a young boy who, when he saw *Marble Madness* on the Commodore Amiga, exclaimed in an excited voice: "That's better than anything you will see at the arcades, dad." Whether his father believed his son I cannot say but with due respect both to the Amiga, and the excellent conversion of Marble Madness, I would have to argue with his opinion.

The last time I visited the arcades, *Space Harrier* was all the rage, and *Nemesis* had recently been voted top game of 1985. As with all leisure industries, things change quickly and neither of those games can be seen now in any of the top arcades.

What has happened, however, is that software companies have become a great deal more ambitious when approaching companies for licences. It reached its most ridiculous stage when Elite announced that it would be producing a version of *Space Harrier* for the Spectrum, a machine on which *Space Invaders* suffers from colour clashes.



Interactive hydraulic games seem to be the order at the moment, with both Konami and Sega launching radically different driving games which promise to dominate the market up to and after Christmas. The first to reach these shores



is from Sega, called *Out Run*. To describe it as the most realistic driving simulation yet would be an understatement. It features graphics of a higher resolution than Space Harrier, a choice of theme tunes, vertical as well as horizontal scrolling – allowing for travel up and down hills – and a hydraulic mechanism which has its occupants sweating in seconds.

The object of Out Run is to travel along various roads, reaching the relevant checkpoints before your allotted time expires. To make life considerably more difficult, the roads on which you travel are public highways and therefore contain trucks, pick-ups, as well as Porsche and Corvette clones.

Anyone with a vague knowledge of cars will immediately recognise the car on which the game bases itself as a targa-topped Ferrari Testarossa – even though only one of these cars has ever been built – right down to the prancing horse on the back of the car.

If there is one game which might possibly give Out Run a run for its money, it has to be *WEC Le Mans 24* from Konami. Using a similar one-man cockpit view to Out Run, the game is different in one fundamental way, as you are not racing on roads but on an accurate representation of the famed Le Mans track, including the fearsome 240mph Mulsanne straight.

Again, the graphics are exceptional and it shows that *Pole Position* certainly can be improved on, a fact which was doubted until a few months ago. I certainly look forward to Elite trying to convert either of those games, while still retaining some similarity to the original.

While on the topic of motorised transport, it is pleasant to see that the motorcyclist has not been ignored, especially considering the success of *Hang-On*. The newest title is *Enduro Racer* from Sega and it is to motocross what Hang-On was to road racing. Using Space Harrier-esque graphics, and sitting on the shell of a motocross bike, you must travel round a course, pulling on the bars to balance the bike over the table-tops. Using more than 1MB of dedicated video



RAM, the game is already in the arcades and is proving highly successful, not surprisingly.

One of my favourite new arcade games is *Gauntlet II*, the newest adaptation of the timeless classic which U.S. Gold has released recently. The new game features more than 100 new maze layouts and some features which will ensure the new version is just as popular as its





predecessor. One of the best features in my view is the new method of character choice which means that, for instance, four wizards can go on the rampage together.

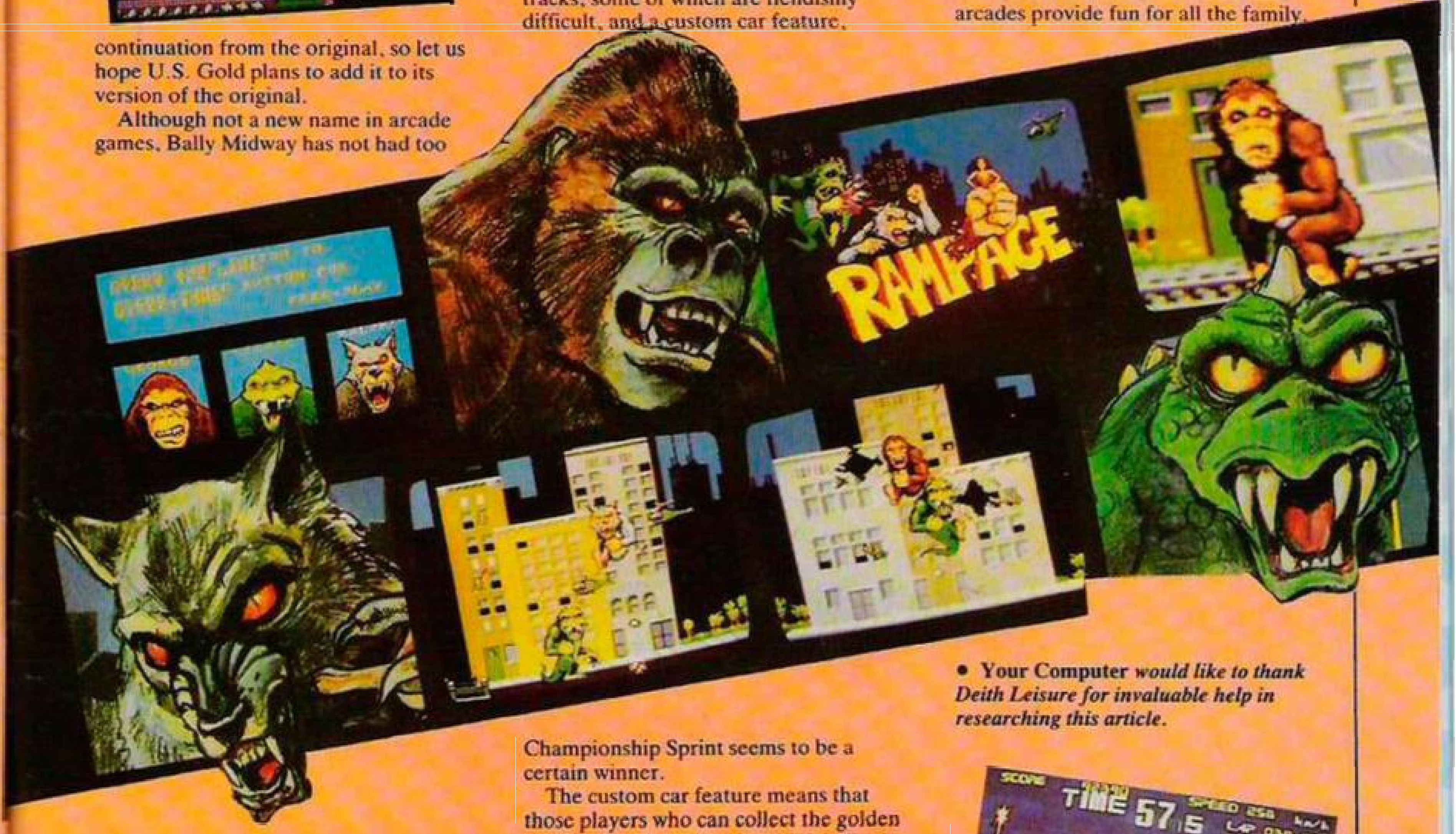
Dedicated Gauntlet fans will be glad to hear that Gauntlet II features something called Secret Rooms which, when discovered, give permanent spells to whoever can perform a task set by the computer. All the original potions and opponents are still there and added is a fire-breathing dragon which guards the exit from each maze.

Overall, Gauntlet II is a worthy



continuation from the original, so let us hope U.S. Gold plans to add it to its version of the original.

Although not a new name in arcade games, Bally Midway has not had too



many hits recently. That seems set to change drastically with the release of *Rampage,* which is not only one of the most playable but certainly the most amusing thing to hit the arcades for some time.

As with most games currently released, Rampage is a multi-player game, with up to three players taking the role of a movie-type monster. You have the choice of George the Gorilla, Lizzie the Lizard and Ralph the Wolf. One thing they all have in common is the desire to cause havoc and destruction in a town dominated by skyscrapers.

The graphics on Rampage are really pretty but the laughs gained when one of the characters eats something which does not agree with him is worth 20 pence. When a screen full of buildings have been demolished and the marines have been forced to take some of their own medicine, the game continues with new and more difficult screens.

Another update from Atari, along the same lines as Gauntlet, is *Championship Spint,* a new version of the ever popular *Super Sprint.* With a variety of new tracks, some of which are fiendishly difficult, and a custom car feature, Championship Sprint seems to be a certain winner.

The custom car feature means that those players who can collect the golden spanners as they zoom round the circuit can be rewarded with new features such as higher top speed, turbo acceleration, super traction and faster recovery from collision. The more money you put into the machine, the longer you will play and the more custom car features you can accumulate.

Of all the games I saw, the one which could most easily be a target for software houses to convert is *Renegade,* by Taito. Using a gangland background scenario and some excellently-defined thugs, the game seems to be a combination of karate and wrestling, featuring such moves as a knee to the face or a bodythrow.

Another game which will surely be converted soon, especially as its by the favourite Elite arcade house Capcom, is *Speed Rumbler.* Set in a Mad Max-type futuristic war zone, it is your task to free your family and bring back peace to your home town. The graphics are slightly updated from the days of *Commando* but the gameplay is just as good and, judging by the crowds around the game, it is bound to be a success.

To conclude, I would like to point out that much of the criticism of arcades is unfounded and that, in small doses, arcades provide fun for all the family.

• **Your Computer** ***would like to thank Deith Leisure for invaluable help in researching this article.***



THE REALISTIC COMPUTER

The Tandy 1000EX is an IBM-compatible clone. K. D. Peel examines its specifications and operating potential.

The Tandy 1000EX review machine was an early production version and is slightly different from those on display in Tandy stores. Two space connectors protrude from the rear of the machine for FCC purposes, a 640K internal memory expansion was fitted initially and there were four legends above the first four function keys.

The computers in Tandy stores do not have 'TV mode' above F2 – if the legends are not visible, they are covered by small plastic strips. The review machine, except for minor differences, is representative of the machines in the stores.

The Intel 8088-based 1000EX is supplied as two pieces of hardware, a console with integral keyboard and 360K disc drive and a VM-4 display monitor. The hardware looks good and, with the optional monitor stand, provides a very pleasant set-up. The keyboard is consistent in the pressure and the depression required to register and has that characteristic springy Tandy colour computer feel.

The console does not accept IBM PC expansion cards of any kind and requires special, rather expensive Tandy versions. The green screen monochrome monitor supplied is a medium/long persistence screen, giving good picture stability, but which tends to leave a trail of fast-moving graphics. I preferred the display on my old mono TRS-80 video monitor. Those who already have that monitor may find paying the additional £100 for the colour version worthwhile.

The low cost shows in the non-standard rear PCB edge connectors used for the standard printer port and second disc drive; I would like proper plugs or a means of fixing the connector permanently. The special printer connector supplied by Tandy costs £23. I do not know of any other cheap clone supplier which would charge that amount for a printer cable. Looking at the cost of the other expansion items suggests it will be an expensive computer to upgrade.

Adequate

The CM5 colour monitor is adequate for the 640 x 200 pixel high-resolution colour display but not ideal for continuous use. Much of the software produced for the IBM and its clones is dependent on the use of colour and that means that mono displays are sometimes difficult to read.

I am still dubious about the merits of sitting in front of a colour display all day. It gives greater eye-strain and higher radiation levels than monochrome displays. The Tandy permits the user to employ a black-and-green mono monitor or a colour monitor. There is also the option of a modulator to couple to TV screen for 40-column operation and games.

HARDWARE	
Tandy 1000EX, 256K RAM, mono monitor	£516
128K memory expansion, DMA circuit and twin expansion socket	£114
256K RAM kit	£91
RS232C option card	£79
External 5.25in. 360K disc drive	£194
CM5 colour monitor	£229
Centronics printer lead	£23
SOFTWARE	
PFS write	£137
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PFS file	£102

Sometimes noisy

The 5.25in. built-in Teac disc drives are sometimes noisy when compared to the more modern 3.5in. drives but were reliable in the limited use of the review.

The computer is an IBM-compatible, with many of the IBM machine weaknesses built-in; the following comments relate to most IBM clones and are presented to provide background information.

The first surprise to the unwary home user is the fan. In a Tandy store environment it is not obtrusive; at home on a desk in a quiet room, it is. The single disc drive machine occupies a smaller amount of desk space than the IBM but it still has a large footprint, even when the optional monitor stand is purchased. That will be increased further by an optional second disc drive, which must be external.

The system boots-up with the message '256K memory size'. The first problem is that discs are loaded into the drive from the right-hand side instead of the more usual front-loading, therefore an additional 15cm. (6in.) free space to the side is required to load the discs. That also means that accessories and cabling generally have to be on the left of the machine.

Obviously the user should not withdraw a disc when the drive is running, so why put the 'drive in, use light' at the side where it cannot be seen? One rather unkind comment made by a friend was that Tandy should use the power light for that purpose, as the user can listen for the fan when the machine is on.

Because I was not provided with system discs I tried more operating systems than usual and arrived at the following conclusions:

The Tandy runs MS-DOS 3.2 but requires minor re-definition of some of the keys as they do not follow the standard IBM keyboard placement. In particular, the cursor keys are separate and not on the numeric keypad 2, 4, 6 and 8 keys, which causes problems with some public domain software I tried.

I expect many users – not corporate or educational buyers – to use public domain software rather than buy the relatively expensive commercially-packaged products. In this area, although the majority of programs ran, most needed minor alterations to the key-mapping and the graphic characters displayed were incorrect on occasions.

Comprehensive

The *Deskmate* software is comprehensive in its range of facilities and provides a good introduction to drop-down menus, although it is limited in performance; whether most users will need the full-blown products is debatable. Like the competitive systems, the Tandy software is packed into the minimum number of discs, requiring unpacking on to more discs before serious use can begin.

Some software – *VP Planner* and the like – will not run on the basic 256K machine, as part of RAM is used by the video memory, although the

program will run with the 128K memory expansion installed. That point should be watched carefully when choosing software to run on a basic 256K machine.

The computer is supplied with four manuals. In Practical Guide to the Tandy 1000EX I am not sure the first example command given in the MS-DOS introduction should be 'format'. Otherwise it is a very rudimentary guide to MS-DOS and the hardware for beginners.

Tandy 1000EX Quick Reference Guide covers the commands for MS-DOS, EDLIN, the MS-DOS editor, Debug, the debugger and Basic.

Program review

Tandy Personal DeskMate is a comprehensive review of the Tandy DeskMate program, covering the seven applications – the desk-top organiser, the small word processor, the spreadsheet – limited to 99 rows and 99 columns – the database, paint, calendar and telecom applications; and 10 accessories – the five-page notepad, calendar, 15-digit calculator, telephone directory, clipboard, colours, communications, date and time, mouse and printer which, by the way, refers to the obsolete DMP 110 printer.

Personal DeskMate Quick Reference Guide is a simple card of the useful keyboard commands. Diskette Organiser is a thin cardboard wallet housing the distribution discs.

Cheap introduction

The compatible ROM BIOS is provided by Pheonix Software Associates Ltd, version 1.02, and the machine runs all the standard software – *Flight Simulator*, *Lotus 1-2-3* and so on. The 1000EX will not run some of the public domain software; the keyboard code translations are incorrect for some software, as the cursor keys do not map to the numeric keypad 2, 4, 6 and 8.

A single-drive 1000EX is a cheap introduction to IBM-compatible computing but is expensive to upgrade. The computer is pleasant to use and except for the high cost of upgrading, would represent good value. The package includes an invaluable one hour of tuition and one year of hot-line support.



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NEXT MONTH

Highlights of our January issue

Contents subject to late revision

THE YEAR'S BEST
As is appropriate for the January issue, *Your Computer* will review the last year and highlight the best software and hardware of 1986.

COMPUTERISING YOUR HOME
Justifying a computer is always a personal task but this guide will give you a host of practical uses for your computer in the home.

PLUS
Your chance to win a monitor in this exclusive *Your Computer* competition.

SPECTRUM TO AMSTRAD, PART TWO
In the conclusion of this article, the final part of the listing will allow data transfer between two increasingly-popular machines.

NOLAN AND HIS ANIMALS
The man who founded Atari has discovered a new direction in which to channel his undoubted genius. *Your Computer* looks at his latest ideas.

January issue on sale December 19, 1986

NEWS ● REVIEWS ● HINTS & TIPS ● CLUBS ● SOFTWARE GUIDES

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ADVERTISERS INDEX



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The 520ST-M keyboard costs only £346.96 (+VAT=£399) and includes an RF modulator and cable, allowing you to connect it to an ordinary domestic TV set. The keyboard is supplied with 512K RAM, a mouse and a free set of 3½" disks containing applications software. For a limited period from August 11th 1986, we have some special packs offering combinations of the 520ST-M keyboard with a ½ Mbyte SF354 Atari disk drive and an Atari monitor (either the Mono SM124, or Colour CM36512). These packages offer up to £200 extra discount on a system. If purchased from Silica, they also come with our free 'ST STARTER KIT'. All of the pack prices shown in the chart include VAT.

UPGRADE TO 1024K RAM

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REDUCED PRICES

Atari's ST personal computers are now firmly established both in the USA and Europe. The main attraction of the ST range is the value for money which these computers represent, giving both private and business users a powerful asset at a very modest price. There are now several ST packages available from Silica at a reduced price, further enhancing the Atari 'Value for Money' reputation. In addition, we are giving away a FREE Silica 'ST STARTER KIT' with every 520 or 1040 ST purchased at Silica Shop. These offers will only be available for a limited period and commence on 11/8/86.

POWER FOR BUSINESS

The list below shows some of the new business products which have been recently launched for the Atari ST range. It gives an indication of the ST's potential to business buyers looking to install a powerful, low-cost system:

CP/M EMULATOR
20Mbyte HARD DISK
LOTUS 123™ CLONE
dBASE III CLONE
IBM COMPATIBILITY
VT100 EMULATOR
MICROSOFT WRITE
dBASE II

Any ST computer will provide its user with a very powerful asset, utilising a vast range of applications, particularly in the business world. Many software companies have been quick to recognise it for its business potential, and have produced programs for the ST which harness this potential. In addition, there are several peripheral and hardware products becoming available to add to the ST's 'Power For Business'. Software now available includes dBMan, a dBASE III clone as well as H&D Base, a dBASE II clone. In fact, First Software have now launched Ashton Tate's original dBASE II program for the ST. In addition, PC Intercomm is a VT100 emulator which enables you to use any ST keyboard as a terminal connected to a mainframe or mini. Other programs include a powerful accounts package by Cashlink and a Lotus 1-2-3™ clone called VIP Professional. Microsoft have announced that their powerful word processor 'Microsoft Write' will soon be available for the ST. Many packages are available for very specific market applications including a powerful CAD (Computer Aided Design) program called Easy Draw from Migraph. In addition, there is an engineering tool called PC Board Designer by Abacus Software which will enable the user to design printed circuit boards. For further details of how the ST can help in your business, return the coupon below. We will be pleased to send you our latest newsletter and price list.

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We hope you will find that the combination of our low prices, FREE delivery service, FREE Starter Kit and after sales support, will be enough to make you buy your Atari equipment from Silica Shop. If however, there is something you wish to purchase, and you find one of our competitors offering it at a lower price, please contact Owen Pascoe (Office Manager), or one of the telesales staff in our sales department. When you telephone us, please provide us with our competitors name, address and telephone number. Providing our competitor has the goods in stock, we promise to match his offer (on a 'same product - same price' basis) and still provide you with our normal free delivery. You will also be entitled to our full after sales service, including free newsletters and technical helpline support. We don't want you to go anywhere else for your Atari products. So shop at Silica, the U.K.'s undisputed No1 Atari specialist.

FREE SOFTWARE

When you buy a 520 or 1040 ST computer keyboard from Silica Shop, you will receive a large and varied software package free of charge. This package consists of twelve programs. Wherever you purchase your Atari ST computer, you should receive the first six software titles as standard. However, if you purchase your ST from Silica, you will also receive a further six extra titles, giving you a total of twelve. All ST's now have TOS/GEM already installed on ROM, so the list of free software you should receive is as follows:

1) GEM - *DR Desktop environment with WIMP (fitted in ROM)*
2) TOS - *Tramiel Operating System (fitted in ROM)*
3) 1st WORD - *Word Processor by GST using GEM*
4) BASIC - *Personal Basic by DR (with manual)*
5) LOGO - *Logo language by DR (with manual)*
6) NEOCHROME - *A powerful colour paint and graphics package (only useable with colour systems)*

If you purchase your ST from Silica, not only will you receive the standard six pieces of software as listed above, but we will also give you the following six additional programs FREE OF CHARGE:

7) MEGAROIDS - *Asteroids type game by Megamax*
8) DOODLE - *Simple paint/doodle drawing package (works on mono or colour systems)*
9) CP/M EMULATOR - *Allows use of DR's Z80 CP/M software to run on the ST range*
10) CP/M UTILITIES - *Various utilities to use with CP/M*
11) DEMONSTRATION & PUBLIC DOMAIN SOFTWARE - *Various games, demos and accessories*
12) CARDS - *A unique set of card games from Microdeal*

These additional free software titles are all part of the FREE Silica 'ST STARTER KIT', return the coupon below for further details.

FOUR FREE MANUALS

In addition to the free software which will be given to you when you buy your ST from Silica, you will receive four free manuals:

1) **ST OWNERS MANUAL (80 pages):** *Easy access to the information you require to unpack, set-up and become familiar with the ST.*
2) **ST BASIC SOURCE BOOK & TUTORIAL (240 pages):** *Gives you the information to increase your level of programming expertise.*
3) **ATARI LOGO SOURCE BOOK (77 pages):** *A source book for Logo, showing how to use the language in the GEM environment.*
4) **1st WORD MANUAL (48 pages):** *Instructions for 1st Word.*

ST NEWSLETTER

8 PAGES OF INFORMATION TO HELP YOU TO DECIDE

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1040ST-F

For the businessman and the more serious home user, there is the 1040ST-F with 1024K RAM. This can be used in a business environment as a stand-alone system, or can support a mainframe computer as a terminal. The 1040ST-F keyboard with integral 1Mb disk drive costs only £699 (+VAT=£803.85). As the 1040ST-F was manufactured solely with business use in mind, it does not come with an RF modulator for use with a domestic TV. Instead, it requires a monitor. There are three Atari monitors available and the prices for the 1040 with these monitors are as follows:

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1040 Keyboard + High res mono monitor - **£799** *(+VAT= £918.85)*
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The 1040ST-F includes 1Mbyte of RAM as well as a 1Mbyte double sided disk drive and mains transformer, both built into the keyboard to give a compact and stylish unit, with only one mains lead. The 1040ST-F is supplied with a set of software disks as well as our own FREE Silica 'ST STARTER PACK'. Call into your nearest branch of Silica Shop for a demonstration.

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